Volume 3, Number 7 $3.50

Scholastic's Magazine for Today's Elementary Classrooms

TEACHING and computers

Scholastic Inc.

April 1986

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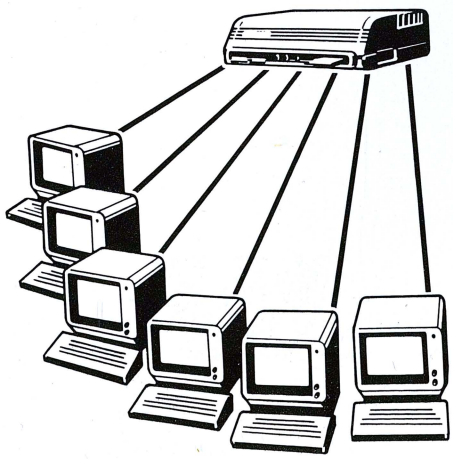

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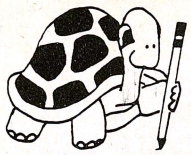

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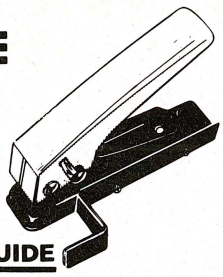

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TEACHING and computers®

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Vol. 3, Issue 7

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Good breakfast habits have a direct affect on how well kids do in school. Here's a BASIC program listing that will teach children how to make the first meal of the day a nutritious and successful one.

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COVER PHOTO: RICK BARRICK

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UPDATE

NEWS FOR COMPUTER-USING TEACHERS

PRESCHOOLS USE MORE COMPUTERS

Child-care centers with preschool programs are 10 times more likely to have a microcomputer than regular day-care centers. This finding, and others on microcomputer use in child-care centers, were recently released by the Mike Wilson List Counsel, Inc., a Los Angeles-based early childhood list compiler.

The list counsel sent surveys to 58,000 centers and asked each to reply only if it used computers with children. Four hundred ninety responded to the questionnaire. Seventy-five percent of these were preschools. Only 18.8 percent were day-care centers, 4.4 percent Montessori schools, and 2 percent Head Start programs.

The List Counsel also found that centers serving children age five and older are more likely to have a computer than centers limited to those below that age.

SOFTWARE THAT YOU CAN REPRODUCE — LEGALLY

A growing number of educational software companies have begun selling "site-licenses" to schools. These licenses permit schools to make as many copies of a software program as needed. Following is information on a few of these companies:

- Elfware, P.O. Box 118, Pollock Pines, CA 95726; 916/644-3300. When you purchase an unprotected master copy ($25 per software program) of any four of its early education programs (*Elf ABC, Elf Games, Elf Games II,* or *Elf Coloring Book*), you obtain the right to make as many copies as your school needs.
- Houston Independent School District, 5300 San Felipe, Houston, TX 77056, Att: Kerry Reynolds; 713/960-8888. *D.O.T. Writer,* a word processing program, and *D.O.T. Tutorial,* a program that explains concepts of word processing to children, are available with site-licenses. To estimate the site-license cost per program/per district ($500 minimum), multiply 15¢ by the number of children in your district.
- Aquarius People Materials Inc., Indian Rocks Beach, FL 33535; 813/595-7890. The minimum fee (again dependent upon number of students per district) is $6,000. This allows you to reproduce unlimited copies of any program printed in red ink in the company's catalog (more than 200 programs).
- Logo Computer Systems Inc., 555 W. 57 St., Suite 1236, New York, NY 10019; 800/321-5646. In New York: 212/265-5646. For $395 your school receives a site license, and an Apple- or IBM-compatible version of the new *LogoWriter* program. See this month's "Ask the Experts" column for more details.

CORVUS REDUCES COST OF NETWORKING

The cost of networking a classroom of computers using Corvus Systems' Omninet Local Area Network interface card is now $199 per computer; less than half of what it was at the start of this year.

The interface card can network IBM, Apple IIe, and/or Macintosh computers. It allows you to store more than 1,000 software programs (depending on the programs' size, and the size of the system you opt for). You can send electronic messages to a student, or to an entire class. Add certain "peripheral devices" to the system, and students can share a printer, or make a tape backup of a software program.

Omninet cards snap into slots on IBM and Apple IIe computers, or connect to the modem port of a Macintosh. To add a new computer to the system, simply add a "tap box" to the new computer. A lay person can do this without technical assistance.

The price of Omninet, $199 per school computer (reduced from $495), includes initial installation fee. Additional education discounts are available. Contact: Corvus Systems, Inc., 2100 Corvus Dr., San Jose, CA 95124; 408/559-7000.

FREE CATALOG OF LOGO MATERIALS

A free 12-page catalog produced by K-12 MicroMedia describes selected Logo reference and resource books, textbooks, activity cards, workbooks, and other materials. Items in the catalog are compatible with Apple, Atari, Commodore 64, and IBM-PCs. For a complimentary copy, contact K-12 MicroMedia, Dept. L, 172 Broadway, Woodcliff, NJ 07675; 201/391-7555.

TOLL-FREE NUMBER FOR SPECIAL ED INFO

Information on special education organizations, as well as related software programs and assistive devices (such as alternative keyboards), can be obtained by calling a toll-free phone number set up by the Center for Special Education Technology. (You must use a touch-tone phone.)

The types of information available are listed on a written "menu," which you can obtain by mail. If you don't have the menu, the options are read to you by phone. Right now, 14 options are available.

After you have reached the center via the toll-free number and have determined your information option, press its extension number. This will activate the message you wish to hear. At the end of a tape you can leave your name, address, phone number, and a request for more information.

For a copy of the menu, write to: Center for Special Education Technology, 1920 Association Dr., Reston, VA 22091; 703/620-3660. The toll-free number is 800/345-TECH. In Virginia, call 703/750-1276.

COMPUTER CONFERENCE

Apple Computer Inc. will sponsor a one-day conference on integrating computers into the K–12 curriculum, Friday, May 2, at the Loews Glenpointe Hotel in Teaneck, New Jersey. The conference will include "pace-setting demonstration programs" in which "teachers teach teachers." Beverly Hunter, author of *My Students Use Computers* (Reston Publishers), will be the keynote speaker.

The conference fee is $25, which includes lunch. Registration is limited. Contact: Fern Knoll, Apple K-12 Conference, 215/866-7759. ■

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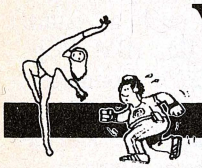

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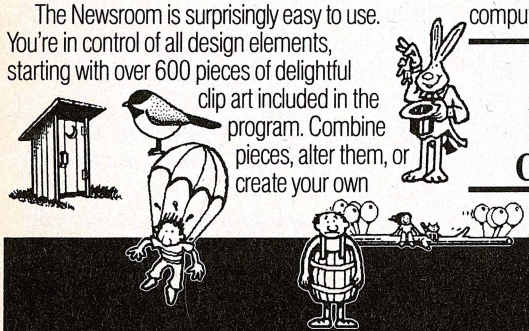

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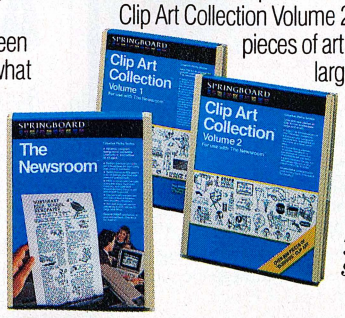

The Newsroom is for everyone. Look for it at your favorite software store.

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The Newsroom: Commodore 64/128—$49.95. Apple II+, IIe, IIc & IBM PC—$59.95. Clip Art Collection Volume 1—$29.95 All formats. Clip Art Collection Volume 2—$39.95 All formats.
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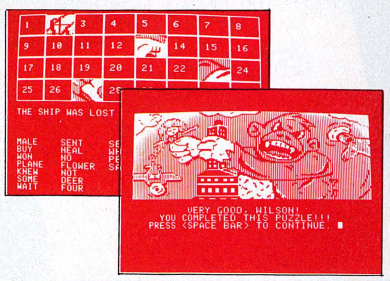

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ANSWERS TO YOUR COMPUTER QUESTIONS

LOGO THAT WRITES

Q ***Is there a software program that lets children easily combine their Logo graphics with text? This process is so awkward with our Logo package that my students use Logo to create graphics and a word processing program to write the stories or reports that go with the graphics.***

Saul Karpen
Otis, MA

A If you have an Apple or IBM PC computer, you're in luck. You can use a new software package called *LogoWriter*. In *LogoWriter*, children use Logo programming to create graphics and then standard word processing functions *or* (they are given a choice) easy-to-use Logo editing procedures to place text on the screen next to their graphic designs.

A site license package that costs $395 per building allows schools to copy as many disks as needed. For more information, contact Logo Computer Systems Inc., 555 W. 57 Street, Suite 1236, New York, NY 10019; 800/321-5646. In New York call 212/265-5646.

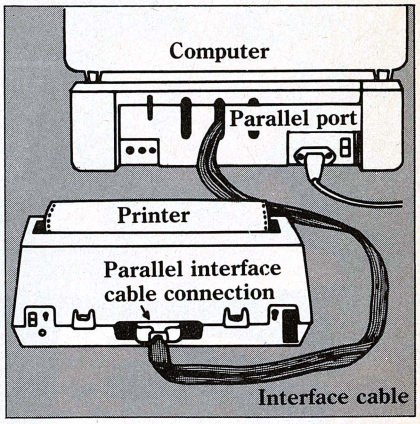
MIXING AND MATCHING PERIPHERALS

Q ***We have an Atari computer in our lab. Will our Apple disk drive work with it? Can we mix and match other peripherals?***

Gayl Goldberg-Suede
Fort Smith, AR

A Every disk drive is designed to work with a specific kind of computer, and not with any others. An Apple disk drive won't work with an Atari computer. You can buy a disk drive from the company that manufactured your computer (in this case, Atari) or from a third party manufacturer if the disk drive is designed for your computer model.

Other peripherals, such as modems and printers, are more versatile. For example, you may be able to use the same printer with different brands of computers if the printer has the right *interface* (a connecting device) and accompanying cable to make each connection (see illustration on this page).



Hooking an Okidata printer to an Apple II Plus computer.

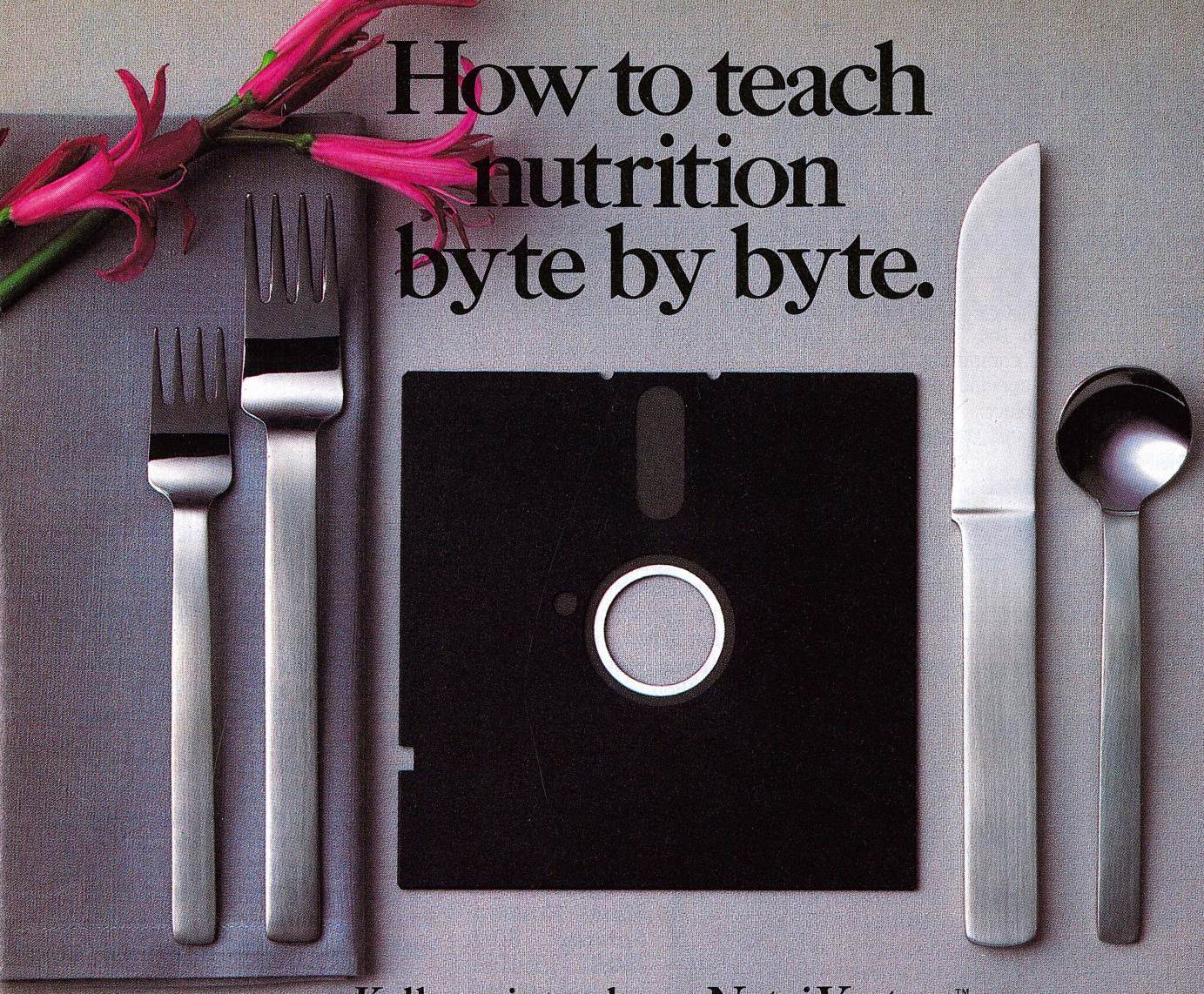
For each computer, you have to match the printer's interface with the computer's *port* (the outlet where a peripheral connects) so that an interface cable can connect the two. Some computers, such as Apple IIe, IBM PC, and most Radio Shack models, have standard serial or parallel ports that are compatible with the interfaces on a variety of peripherals.

Other computers, such as Atari, Commodore, Apple IIc, IBM PCjr, and Radio Shack's Color Computer, have unique ports and require peripherals with special interfaces and cables designed for them. Owners of these computers can, however, expand their peripheral options by purchasing an *adapter* (a plug-in device or card) that converts their computer's nonstandard port to a standard one.

There are also degrees of operational compatibility. For example, a printer may not have the ability to print special characters, such as foreign language accent marks, on a specific brand of computer, while another printer would.

Finally, check to see that the peripheral you use has compatibility with the software you use. If your word processing program is not fully compatible with your printer, you may not be able to take advantage of special options, such as printing in italics or bold face. ■

How to teach nutrition byte by byte.



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Learning about nutrition can be fun with *Nutri-Venture*, three exciting new computer games your students are sure to love. There's *Breakfast Criss-Cross*,™ pitting two players against each other in choosing the winning breakfast menu. *Nutrition Shuttle*,™ with the mission of managing energy intake and output to control weight. And *K-2000 Computer*,™ which tests nutrition knowledge as players answer questions to progress from Computer Security to Master Control.

The *Nutri-Venture* kit, designed for grades 7-12, includes all three games on one 5¼" floppy diskette in two popular microcomputer formats. Plus a teacher's manual, three reproducible reference and activity sheets and three colorful posters for your classroom. All in a sturdy vinyl folder. For just $25.00.

With *Kellogg's Nutri-Venture*, you won't have to spoon-feed your students nutrition education. They'll devour it. Byte by byte.

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TCA86

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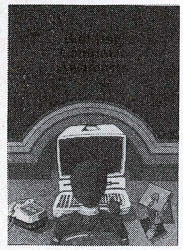
Technology Texts

BY CANDY COLBORN

The following new textbooks teach children the "lingo" and procedures of computing. Many focus on a specific computer language and/or subject.

COMPUTER EDUCATION SERIES

West Publishing's Computer Education Series, by Steven L. Mandell and Colleen J. Mandell, includes a wide range of texts for grades K through 12. Reviewed here are three texts designed for fourth through sixth graders. (Each copyright 1985.)



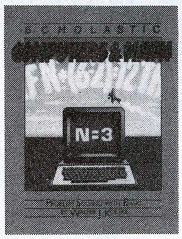
Building Computer Awareness ($14.95), is designed to be used as an introduction to computer literacy. Its short, easy-to-read sentences cover various aspects of computers from their history to their use in our lives today. All chapters contain learning objectives, summary points, review paragraphs, discussion questions, and suggested activities. Crisp, black-and-white photos are well placed, and new terms are defined in the margins, as well as in a glossary.

The teacher's manual is divided into two sections: one that contains chapter overviews, objectives, and lesson plans; and another that provides additional teacher materials to use with the book. Among the materials are blackline masters and resource lists.

Building BASIC Skills, Book A, ($10.95) is a combination text/workbook for beginners in BASIC programming. The book is designed for use on Apple II series computers, but modifications for the IBM-PC, Commodore 64, and TRS-80 are provided throughout the text, and in appendices in the back. In addition to hands-on programming activities for kids (labeled "Your Turn" sections), each chapter includes learning objectives, programming problems, a vocabulary list, summary points, and a chapter test. The teacher's manual is set up like the *Building Computer Awareness* manual.

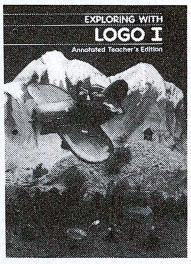
Building Logo Skills, Book A ($10.95) is also a combination text/workbook. It provides instruction on both graphic and list handling capabilities of Logo. It has the same chapter elements as *Building BASIC Skills,* including hands-on activities that are titled "Your Turn." Children who have already been exposed to Logo will breeze through the first chapter. They'll find, however, that the programming problems that follow are more thought-provoking. The teacher's manual is organized like the other two West books.

SCHOLASTIC COMPUTERS & MATH



Walter Koetke's text ***Scholastic Computers & Math: Problem Solving With BASIC*** (Scholastic Inc; 1986; student text book-$21.27; paperback teaching guide-$14.60) helps kids use the computer as a problem solving tool in mathematics. The seventh through twelfth graders who use it will be pleased by the "storyline." (Can you imagine? In a math book!) Teachers will also be happy when they find that the "plot" makes the factual content easier and more interesting to follow. The opening three chapters introduce computer systems, BASIC commands, and problem solving. Chapters four through nine show how computers help streamline problem solving in arithmetic, algebra, number theory, probability, statistics, and consumer mathematics. Throughout the book, sections are filled with real life problems that students can use BASIC programming to solve. Section and chapter reviews provide practice exercises that are listed in order of progressive difficulty. Glossary and special project sections even make this a possible reference for accelerated elementary students. The text can be used with any major education computer. For an extra $26.60, you can purchase an Apple II series disk that contains all the program listings in the book longer than seven lines.

EXPLORING WITH LOGO, I & II



Exploring With Logo I, by Mary M. Campbell and James A. Fenwick (Allyn and Bacon, Inc.; 1985; $6.50 each; $54.96 for a package of 10; $8.67 for teacher's edition) is a colorful workbook that provides a solid introduction to Logo for children in the 5 through 10 age range. A smiling green, yellow, and orange turtle teaches the FORWARD, BACK, LEFT, and RIGHT commands, the REPEAT command, and geometry's "Rule of 360." Students then use the Rule of 360 to learn how to write Logo procedures for making square and rectangular shapes.

Exploring with Logo II, also by Campbell and Fenwick, (same publisher & price information as above), uses a colorful workbook format to introduce circle procedures; the use of color in Logo; building with procedures; and finally, how to transfer knowledge of Logo to the computer. The annotated teacher editions should prove helpful to teachers only a turtle step or two ahead of students in learning Logo.

PUBLISHERS' ADDRESSES

Allyn and Bacon, Inc., 7 Wells Ave., Newton, MA 02159.
Scholastic Inc., 730 Broadway, New York, NY 10003.
West Publishing Co., P.O. Box 64526, St Paul, MN 55164. ■

Candy Colborn is a media specialist at Cottonwood Creek Elementary School in Englewood, CO.

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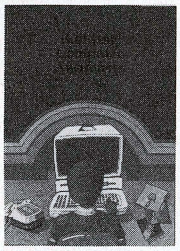
Techn

BY CANDY COLBORN

The following new textbooks teach children the "lingo" and procedures of computing. Many focus on a specific computer language and/or subject.

COMPUTER EDUCATION SERIES

West Publishing's Computer Education Series, by Steven L. Mandell and Colleen J. Mandell, includes a wide range of texts for grades K through 12. Reviewed here are three texts designed for fourth through sixth graders. (Each copyright 1985.)



Building Computer Awareness ($14.95), is designed to be used as an introduction to computer literacy. Its short, easy-to-read sentences cover various aspects of computers from their history to their use in our lives today. All chapters contain learning objectives, summary points, review paragraphs, discussion questions, and suggested activities. Crisp, black-and-white photos are well placed, and new terms are defined in the margins, as well as in a glossary.

The teacher's manual is divided into two sections: one that contains chapter overviews, objectives, and lesson plans; and another that provides additional teacher materials to use with the book. Among the materials are blackline masters and resource lists.

Building BASIC Skills, Book A, ($10.95) is a combination text/workbook for beginners in BASIC programming. The book is designed for use on Apple II series computers, but modifications for the IBM-PC, Commodore 64, and TRS-80 are provided throughout the text, and in appendices in the back. In addition to hands-on programming activities for kids (labeled "Your Turn" sections), each chapter includes learning objectives, pro
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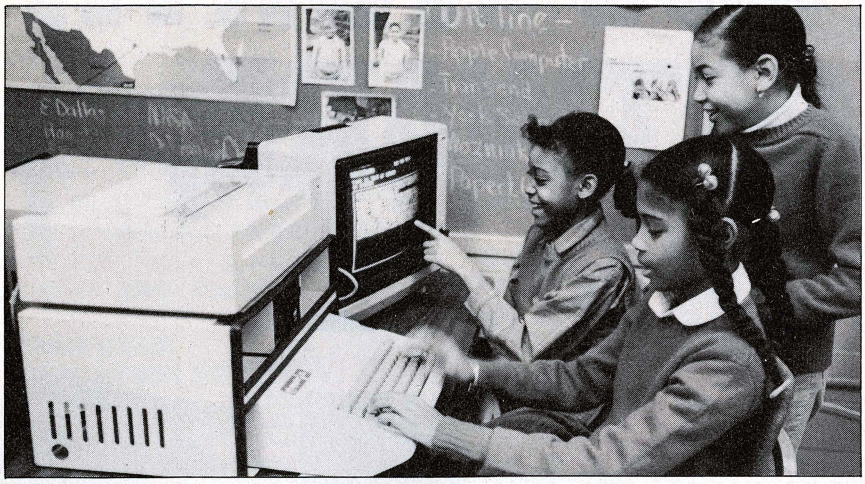
CLASSROOM HAPPENINGS

BY LESLI ROTENBERG



Fisher students keyboard messages to friends at Morley School (both in Hartford, CT).

COMPUTERS CUT ACROSS ECONOMIC DIFFERENCES

Annie Fisher School in Hartford, Connecticut, and Edward Morley School in West Hartford are only four miles apart geographically, but they are further apart culturally. Fisher is in a poor, urban area; Morley is in an affluent suburb. Thanks to computer communication, students and teachers at the schools are getting to know each other. They use an electronic mail service donated by MCI Communications Corporation to transmit messages via modems.

Staff members at The Science Museum of Connecticut, which organized and coordinated the project, are working with teachers at both schools to develop curricula the students can work on in class and then talk about with their neighboring schoolmates through electronic messaging. The common curricula is based on the museum's exhibits. Dinosaurs and Halley's comet are two recent exhibits that have been turned into units of study and the topics of many modem communications.

Modem is not the only means by which the two schools have figured out how to get together, however. Classes from both schools now often attend museum exhibits together. They also take joint field trips to other Connecticut sights, such as Dinosaur Park. Second grade students from both schools worked together on a dinosaur mural, and Morley first graders hosted a party for Fisher students where they served lunch and dinosaur cookies.

Even the school psychologists are involved in the cross-cultural project. Psychologists at both schools are in the process of comparing the students' attitudes toward culturally different children before and after the project.

"Real friendships are developing," says Paulie Brading, Morley school principal. She says some students have even begun to meet electronic pals after school and speak on the telephone.

STUDENTS PLAY THE STOCK MARKET

Who says nine-year-olds are too young to play the stock market? The Stock Market Educational Game, a national academic competition, gives student teams in fourth through twelfth grades $100,000 each in imaginary money to "buy" stock on the New York and American Stock Exchanges. Students learn about business and economics as they buy, sell, and trade stocks with the help of a computer.

The 10-week game, which is cosponsored by The Securities Industry Foundation and 40 regional Centers for Economic Education, provides curriculum materials, computerized forms, and data processing services to interested teachers. The cost varies depending on the regional center, but is usually about $10 for each team of five students.

Most of the regional centers are affiliates of universities, such as the center at Kansas State University's College of Education. Also serving as coordinators for the game are representatives from Newspaper In Education (NIE) programs at some newspapers, such as *The Miami Herald.* The NIE programs usually offer newspaper subscriptions at special rates for participating students.

Students use newspapers to look up closing prices on common stocks prices. They base their own simulated transactions on these prices, and they record their transactions by punching holes in computer cards or shading in circles on scan sheets. For each transaction, students are charged a two percent broker's fee.

At the end of each week, the cards or sheets are sent to a regional center for data processing. There, a mainframe computer prints out stock portfolios for each team, which include the team's beginning net worth, a list of the transactions it made during the week, and its net cash value at the end of the week. Students receive their adjusted portfolios in the mail each week.

At the end of the competition, award ceremonies are conducted to recognize winners — those teams that have increased the market value of their portfolios by the greatest amount. The competition is divided into elementary and secondary groups and also into geographic regions. For example, a sixth grade team from Neosho Rapids School in east central Kansas won first place in that state's elementary division this fall, with a final portfolio valued at $113,328.75.

Since its inception in 1977, the Stock Market Educational Game has grown tremendously. During the 1984-85 academic year, about 100,000 students participated nationwide. More than 200,000 participants are projected for 1985-86.

At present, 29 states have regional centers that offer the Stock Market Game two times during the school year, once each semester. For information on the regional center nearest you, contact Sherry Saia at the Securities Industry Association, 120 Broadway, New York, NY 10271. ■

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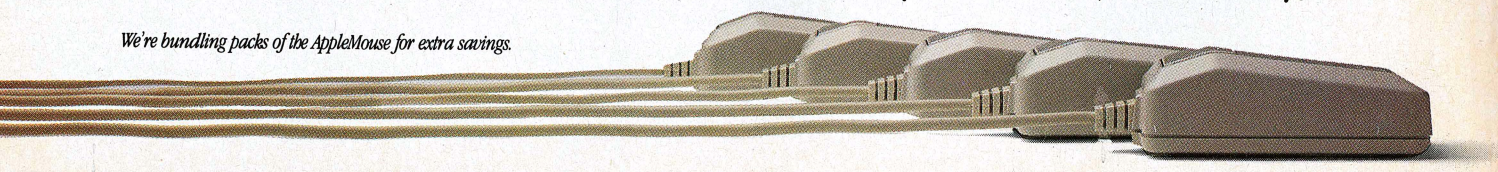
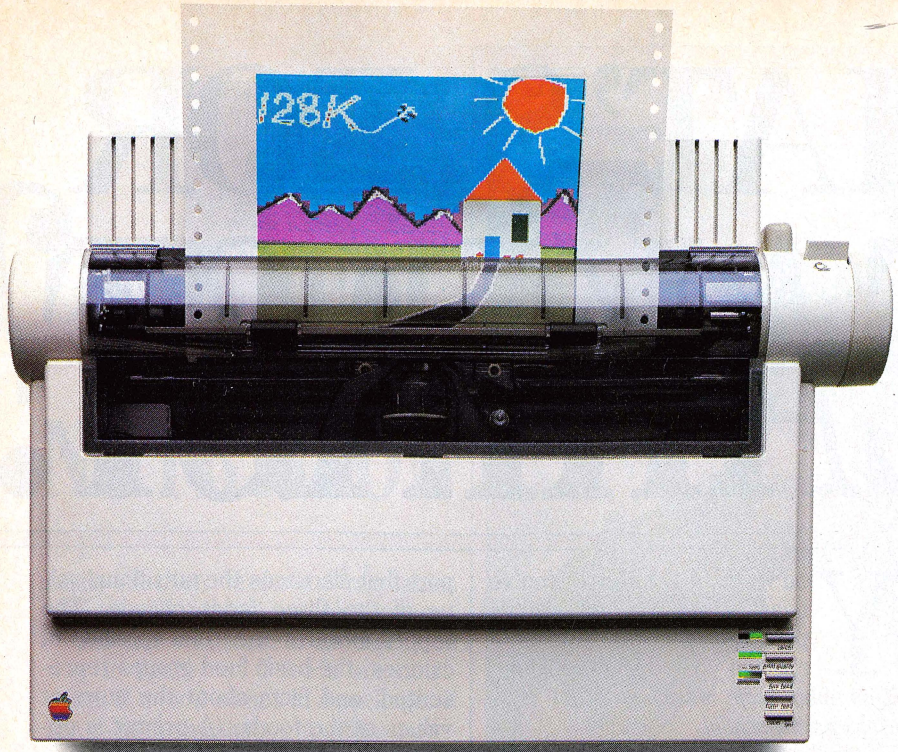
We're bundling packs of the AppleMouse for extra savings.





Your school can get the most out of its Apple computer system with the ImageWriter II printer. When combined with an Apple IIe or IIc, the ImageWriter II produces full color print-outs as well as near letter-quality text.

whole lot of things you couldn't do before, like use an 80-column display, boldfacing, underlining and streamlined printing functions.

By using a 128K Apple IIe and an AppleMouse, you'll be able to run programs like MouseCalc and Instant Pascal that give the IIe many of the same user-friendly features as that most friendly of personal computers, Macintosh.™

Hook our Apple ImageWriter™ II printer to your Apple IIe and you'll be able to print near letter-quality text. As well as full color print-outs of your student's work. So they can take home pictures and stories like the one shown here (created with The Bank Street Storybook by George Brackett).

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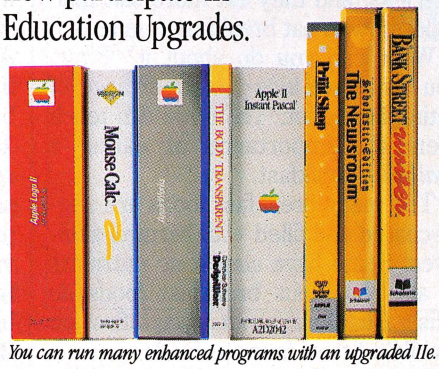

You can run many enhanced programs with an upgraded IIe.

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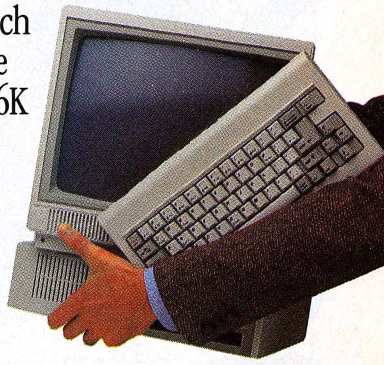
And our Administrative system, which includes the 128K IIe, 256K memory expansion card, UniDisk 3.5 storage device that stores over five times as much information as you can currently, UniDisk 5¼, Catalyst software, and an ImageWriter II.



Finally, we're taking trade-ins. Up to $250 credit toward the purchase of a new Apple computer in exchange for your Apple II, II+, or III, as well as certain models from IBM, Commodore, Tandy and other manufacturers. Your local Apple education representative or authorized Apple dealer will give you all the details.

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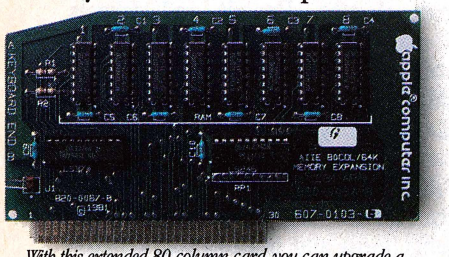
After all, our goal is to stay in school forever.



With this extended 80-column card, you can upgrade a IIe to 128K of memory and 80 columns of text.

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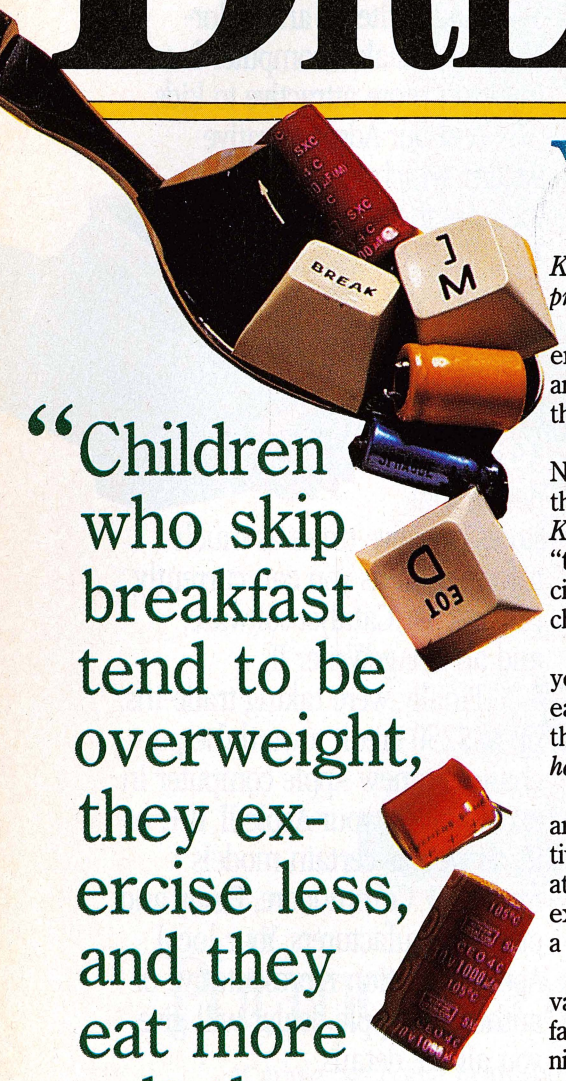
WHAT'S FOR BREAKFAST?



"Children who skip breakfast tend to be overweight, they exercise less, and they eat more salt than children who eat breakfast regularly."

You've read it before. You've heard it before. And, you've probably seen it before — right in your own classroom: *Kids who skip breakfast often have problems in school.*

Reports show that they score lower on tests, they are often restless and disruptive, and they easily lose their enthusiasm for learning.

What's more, according to Annette Natow and Jo-Ann Helsin, the authors of *No-Nonsense Nutrition for Kids*, children who skip breakfast "tend to be overweight, they exercise less, and they eat more salt than children who eat breakfast regularly."

What can you do about it? First, you can teach kids the importance of eating breakfast. Then you can teach them the importance of eating a *healthful* breakfast.

Too many breakfast foods are sugar-coated and filled with harmful additives. Some have almost no nutrients at all! Nutritious breakfast foods *do* exist. But they're not always first on a child's list of favorite foods.

This nutrition unit teaches kids the value of eating good food for breakfast. It also tells them how to recognize nutritious foods by looking for nutrients on food labels, and how to choose a balanced meal that contains foods from different food groups. Finally, it alerts children to the harmful additives and ingredients that can appear in nutritious and nonnutritious foods alike.

The unit centers around a BASIC program called *What's for Breakfast?* (listed on page 18). In the program, students select three items from a menu of 12 breakfast foods. Some of the items are nutritious; others are not. After students have made their selections, the program issues a report that discusses the nutritional value of the three foods chosen. The report includes the total number of calories, the basic food groups represented, and facts about the nutrient values of the foods. (A printer is optional.)

WARM-UP DISCUSSION

Tell students that *nutritious* foods, or foods that are good for them, contain *nutrients*. Nutrients are elements the body needs to grow straight and strong. Important nutrients include vitamins, minerals, proteins, carbohydrates, and fats. A good breakfast should contain all of these nutrients. An easy way to make sure it does is to eat one item from each of these basic food groups:

1. Meat-Fish. Items in this category include hamburger, chicken, fish, pork, peanut butter, and eggs. They provide the body with protein and vitamins. They also provide iron, a mineral that helps build healthy blood.

2. Bread-Cereal. Foods in this category include bread products, cereals, pancakes, rice, and pasta. These items are important sources of B vitamins, which help the body grow at a normal rate. Breads and cereals also contribute protein, carbohydrates, and minerals to the diet.

3. Milk-Cheese. Items in this group include milk, yogurt, cheese, and ice cream. These foods supply most of the calcium in the average American diet. Calcium is a mineral that builds strong teeth and bones. Dairy products also provide protein, vitamins, and fat.

4. Fruit-Vegetable. These foods provide vitamins A and C. Vitamin A helps the body grow and keeps skin healthy. Vitamin C helps the body

By Lorraine Hopping

A TEACHING UNIT ON NUTRITION

resist infection. Fruits and vegetables also provide protein carbohydrates.

Tell kids that there is another good way to figure out if foods are nutritious. If a food comes in a package, it has a label that lists important nutritional facts about it. Pass around food labels from cereal, bacon, jello, juice, bread, pastry, and other packages.

Ask students to give examples of nutritious foods from the food labels. *(Bran cereal, bread, and bacon are a few examples.)* What makes these foods nutritious? *(Encourage students to name specific vitamins and other nutrients in the foods.)*

Are there any foods that have little or no nutrients? *(Yes — pastries, some instant drinks, soda pop, jello, and some cereals.)*

Point out that some foods, whether they are nutritious or not, also contain ingredients that might be harmful, especially if eaten in excess. These ingredients include too much sugar, fat, or sodium; caffeine (found in colas, coffee, tea, and some chocolate drinks); some artificial preservatives (such as BHA and BHT); some artificial sweeteners (such as saccharin); colorings and food dyes; and some artificial flavorings. (If you would like to know whether a specific food additive is harmful, you can contact the U.S. Department of Health and Human Services, Food and Drug Administration, 5600 Fishers Ln., Rockville, MD 20852.)

Ask students to look for such ingredients listed on the food labels. Which foods contain them? *(Bacon contains sodium nitrate, a preservative; many cereals contain extra sugar and artificial additives; fried foods contain extra fat.)* Remind students that foods containing harmful ingredients should be avoided or eaten only in moderation.

Rick Barrick

The labels contain another important piece of information about the food. They also tell how many *calories* per serving the product has. Explain to students that the number of calories a food has reflects how much energy it provides. Foods high in calories provide a lot of energy for the body; foods low in calories provide less energy.

The amount of energy your body needs each day depends on your size, your age, whether you are male or female, and how active you are. Most children between the ages of seven and nine need about 2,100 calories per day. Children between the ages of 10 and 12 need about 2,500 calories. Tell kids that if they are very active in sports or other activities that require a lot of energy or if they are bigger than most kids their age, then they probably need more calories. If they are not active or are small for their age, then the reverse is probably true.

Explain to children that if they eat too many calories, their body will store the excess food in the form of body fat. That's what causes people to gain weight. If they don't eat enough calories, their body will use their body fat for energy and they will lose weight.

Tell students that, in order to get the proper amount of calories in a day, they should try to eat about one fourth of their daily caloric require-

(continued)

"Nutrients are elements the body needs to grow straight and strong."

```
      ***** NUTRITION REPORT *****

PREPARED FOR: PETER

FOODS SELECTED:
     SCRAMBLED EGGS (3)
     BACON (3 BIG STRIPS)
     ORANGE DRINK (8 OZ.)

TOTAL SCORE (500 POSSIBLE): 160

   PETER, YOU HAVE CHOSEN FOODS IN
2 OUT OF THE 4 BASIC FOOD GROUPS.

   NEXT TIME, CHOOSE SOMETHING IN THE:
     DAIRY GROUP
     BREAD AND CEREAL GROUP

   PETER, IF YOU ARE 7 TO 9 YEARS
OLD, YOU NEED 2100 CALORIES PER DAY.
   IF YOU ARE 10 TO 12, YOU NEED 2500
CALORIES PER DAY.

   HERE IS A CALORIE BREAKDOWN FOR THE
FOODS YOU SELECTED:

NAME OF FOOD ITEM                CALORIES
-----------------------------------------
SCRAMBLED EGGS (3)                  330
BACON (3 BIG STRIPS)                135
ORANGE DRINK (8 OZ.)                140
-----------------------------------------
TOTAL # OF CALORIES                 605

ADDITIONAL FOOD FACTS:
   EGGS HAVE A LOT OF PROTEIN. BUT THEY
ALSO HAVE CHOLESTERAL, WHICH MIGHT LEAD
TO HEART PROBLEMS.
   POACHED OR BOILED EGGS ARE BETTER FOR
YOU THAN SCRAMBLED OR FRIED EGGS.

   BACON HAS PROTEIN. BUT, LIKE HOT DOGS
AND SAUSAGES, IT HAS A LOT OF FAT AND
A CHEMICAL CALLED SODIUM NITRATE.

   ORANGE 'DRINK' IS DIFFERENT FROM
ORANGE 'JUICE'. IT HAS LITTLE OR NO
REAL JUICE. MANY FRUIT DRINKS ALSO HAVE
A LOT OF SUGAR.
   READ THE INGREDIENTS ON THE PACKAGE.
REAL ORANGE JUICE SAYS '100% ORANGE
JUICE' AND NOTHING ELSE.
```

A sample nutrition report.

ment at breakfast. That amount will range from about 350 to 600 calories.

Tell kids to look for the number of calories per serving on the food labels you passed out. Can they find three or four nutritious foods that will give them the right amount of total calories for breakfast?

USING THE PROGRAM

Type in and save the *What's for Breakfast?* program on page 18. Have students run the program individually.

The program presents students with a menu of 12 foods: eggs, hash browns, pancakes, puffed cereal, bran cereal, bacon, toast, soda pop, orange drink, tomato juice, jello, and pastry. Students must select three foods from the menu to make a balanced and nutritious breakfast.

After students have made their selections, the program prints out or displays a nutrition report that includes the following information:

- The student's score out of 500 possible points. Students receive points for choosing foods that are balanced among the four basic food groups, and that are nutritious;
- The food groups, if any, that are not represented by the student's food selections;
- The calorie count for each food selected and the total number of calories for the meal;
- Additional nutrition facts about the foods selected.

After all the students have run through the program at least once, discuss the results.

Ask students which combinations of foods listed in the program are the most nutritious. *(The highest possible score is 500, which is achieved by selecting the eggs, bran cereal, and tomato juice. Other good foods include pancakes, potatoes, and toast.)* Which foods are the least nutritious? *(Soda pop and jello.)*

Have students use food labels and books on nutrition to produce a fairly accurate breakdown of the nutrients contained in each of the program's 12 foods. (See the nutrition resources listed at the end of this article.)

Ask students what nutritious foods they could substitute for the nonnutritious foods on the menu. *(Bran muffins could be substituted for pastry, orange juice for orange drink, water or milk for soda pop, fresh fruit for jello, and so on.)*

EXTENDING THE PROGRAM

The last part of the nutrition report provides additional facts about the three foods children selected when using the program. Encourage the beginning programmers in your class to do research on all 12 foods in the program's menu and use their findings to add even more information about them to the program listing.

To do this, have them construct PRINT statements that contain new comments on a specific food and then insert the line statements before the end of the food's subroutine. (Note: The food subroutines extend from line 2000 through line 13040 in the program listing. The RETURN command indicates the end of a specific food subroutine.) Here's an example of food information that could be added to the subroutine on pastry:

```
13031 PRINT " INSTEAD OF PASTRIES,
WHY NOT"
13032 PRINT "TRY A BRAN MUFFIN OR
BAGEL?"
```

Challenge intermediate and advanced programmers to add more food choices to the breakfast menu in the program.

To do so, they must follow these steps:

1. In line 20, change the value of F to the total number of food items in the program. For example, if you are adding one food item, change F = 12 to F = 13.

2. Add a DATA statement for each new food item between lines 190 and 200. The DATA statement should contain the name of the food, the number of calories, the numeral 1 if it is in a food group or a 0 if it is not, and a score. The score generally reflects the nutritional value of the food on a scale from 0 (not at all nutritious) to 100 (very nutritious). Children will need guidance in deciding on scores. Help them take into account the food's nutrient content as well as its calorie count. For example, a food that has some nutrients and is very high in calories should not get as high a score as a food with similar nutrient value that is low in calories. (More information on how to rate foods can be found on the "Nutrition Scoreboard" poster listed in the resource list at the end of this article.)

Here is a sample DATA statement:

```
191 DATA CORN MUFFIN (NO BUTTER),
    155,0,1,1,0,50
```

3. Add a subroutine after line 13040 for each new food. The sub-

routine should provide additional facts about the food. Be sure to include a RETURN command at the end of each subroutine.

Here is a sample subroutine for a corn muffin:

```
14000 REM CORN MUFFIN
14010 PRINT " A CORN MUFFIN IS A GOOD CHOICE!"
14020 PRINT "MUFFINS THAT ARE MADE WITH WHOLE WHEAT"
14030 PRINT "FLOUR AND THAT ARE LOW IN SUGAR ARE"
14040 PRINT "PARTICULARLY HEALTHFUL."
14050 RETURN
```

4. Add the first line number of each new subroutine to the end of lines 990, 1000, and 1010. For example:

```
990  ON X GOSUB 2000,3000,4000,5000,
       6000,7000,8000,9000,10000,
       11000,12000,13000,14000.
1000 ON Y GOSUB 2000,3000,4000,
       5000,6000,7000,8000,9000,10000,
       11000,12000,13000,14000.
1010 ON Z GOSUB 2000,3000,4000,
       5000,6000,7000,8000,9000,10000,
       11000, 12000, 13000, 14000.
```

NUTRITION RESOURCES

These free or low-cost materials provide basic information on nutrition.

Government Publications

The U.S. Department of Agriculture publishes several nutrition pamphlets, books, and educational aids. For a free catalog, write to Consumer Information Catalog, Attn: S. James, P.O. Box 100, Pueblo, CO 81002.

Following are a few of the titles listed in the catalog. To order any of these materials, write to The Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

- *Some Facts and Myths About Vitamins* is a free pamphlet that lists foods that are good sources of vitamins.
- *Consumer's Guide to Food Labels* is a free pamphlet on how to interpret food labels.
- "Fred the Horse Who Likes Bread," "Meet Molly Moo," "Mary Mutton and the Meat Group," and "Gussie Goose Introduces the Fruit and Vegetable Group" are free primary-grade reproducibles (they come as a set) that teach students about the four food groups.
- *The Safe Food Book* is a free booklet on preparing foods safely.
- "Snack Facts" is a free poster about how snacking can cause tooth decay.

Pamphlets, Posters, and Materials From Other Sources

- Public Affairs Pamphlets are a series of pamphlets on nutrition and health that cost $1 each. For a free catalog, write to: Public Affairs Committee, 381 Park Ave. South, New York, NY 10016.
- "Nutrition Scoreboard" is a poster that rates foods according to their nutritional value. It costs $3.50 for a nonlaminated poster and $7 for a laminated poster. Write to: Center for Science in the Public Interest, 1501 16th St. NW, Washington, DC 20036.
- *Today's Food and Additives*, is a free, detailed booklet on preservatives, colorings, sweeteners, and flavorings that are added to food. Other nutrition publications are also available. Write to: General Foods Consumer Center, 250 North St., White Plains, NY 10625.
- *Food Additives* is a similar booklet that is distributed for free to schools and other institutions (use school letterhead when requesting it). Write to: Manufacturing Chemists Assoc., 1825 Connecticut Ave. NW, Washington, DC 20009.
- *Why Do You Need Vitamin C?* is a free booklet that discusses vitamin C on a level that primary and middle grade students can understand. Write to: The Department of Citrus, Florida Citrus Commission, Lakeland, FL 33802.
- *Taking a Look at Food Quality* (for grades 4–6) and *Food Safety: Your Responsibility* (for grades 7–12) are two teaching units on keeping food fresh. Both are free of charge and include a full color wall poster, six activity masters, and a teaching guide. Write to: Food and Safety Quality Service, P.O. Box 14306, Dayton, OH 45414.
- A free catalog of pamphlets, kits, films, and other nutrition materials is available from the National Dairy Council, 6300 N. River Rd., Rosemont, IL 60018.
- A free catalog of educational pamphlets and booklets on nutrition is available from the American Dietetic Assoc., 430 N. Michigan Ave., Chicago, IL 60611.

(continued)

"If a food comes in a package, it has a label that lists important nutritional facts."

SAMPLE FOOD LABEL: ENGLISH MUFFINS

Nutrition Information Per Serving:

Serving Size: 1 Muffin (57 grams)
Calories: 130
Protein: 4 grams
Carbohydrate: 26 grams
Fat: 1 gram
Sodium: 210 milligrams
Cholesterol: 0 milligrams

Percentage of U.S. recommended daily allowances (U.S. RDA) for these nutrients:

Protein	6	Riboflavin	8
Vitamin A	*	Niacin	6
Vitamin C	*	Calcium	8
Thiamine	10	Iron	10

*Contains less than 2 percent of the U.S. RDA of these nutrients.

Ingredients: Enriched wheat flour (unbleached wheat flour, malted barley, niacin, reduced iron, thiamine, mononitrate or vitamin B_1, and riboflavin or vitamin B_2), water, farina, corn syrup, yeast, salt, partially hydrogenated soybean oil with mono- and diglycerides, vinegar, calcium propionate (a preservative), soya flour, nonfat dry milk, and whey solids.

This sample food label from a package of English muffins gives complete nutritional information about the product. By showing kids how to read food labels, you can help them select healthful foods for breakfast.

WHAT'S FOR BREAKFAST?

PROGRAM LISTING FOR *WHAT'S FOR BREAKFAST?*

This program listing is for Apple computers. To convert the program for use on Commodore 64 and the TRS-80 series of computers, see the Conversion Chart on page 58.

To use the *What's for Breakfast* program, first put your computer in BASIC, make sure your keyboard is set in the "all caps" mode, and insert an initialized disk into the disk drive or a cassette into the cassette recorder. (Refer to your user's manual for specific instructions.)

Next, type the program listing into your computer. Be sure to type the listing exactly as it appears, including all line numbers, punctuation marks, spaces, symbols, and letters. Also, be careful to use the "Ø" key to type a zero and the "O" key to type the letter O.

After you have finished entering the program, run it. (Type RUN and press the RETURN or ENTER key.) If you get an error message, such as SYNTAX ERROR IN LINE 200, it probably means that you made a typing mistake on the line specified in the message. Correct any typing errors that you find and run the program again.

After you have corrected all the errors, save the program on disk or cassette. To save it, you will have to give it a name, such as BREAKFAST. (If you don't save the program, it will be erased as soon as you turn off the computer.) You can load the program into your computer and run it as often as you like.

```
10  REM WHAT'S FOR BREAKFAST? @1986 SCHOLASTIC INC.
20  HOME:CLEAR:F = 12:REM NUMBER OF FOODS
30  DIM FI$(F),C(F),MT(F),DP(F),BR(F),FV(F),SC(F)
40  FOR I = 1 TO F
50  READ FI$(I),C(I),MT(I),DP(I),BR(I),FV(I),SC(I)
60  NEXT I
70  REM FOOD, CALORIES, MEAT, DAIRY, BREAD, FR/VEG,SCORE
80  DATA SCRAMBLED EGGS (3),330,1,0,0,0,100
90  DATA HASHED BROWN POTATOES,350,0,0,0,1,100
100 DATA PLAIN PANCAKES (3),120,0,0,1,0,50
110 DATA PUFFED RICE CEREAL,280,0,1,1,0,25
120 DATA BRAN/FRUIT CEREAL,245,0,1,1,1,200
130 DATA BACON (3 BIG STRIPS),135,1,0,0,0,25
140 DATA WHITE TOAST (2 SLICES),140,0,0,1,0,50
150 DATA SODA POP (12 OZ.),150,0,0,0,0,0
160 DATA ORANGE DRINK (8 OZ.),140,0,0,0,1,25
170 DATA TOMATO JUICE (8 OZ.),50,0,0,0,1,100
180 DATA RASPBERRY JELLO (1 CUP),140,0,0,0,0,0
190 DATA JELLY-FILLED PASTRY,275,0,0,1,0,25
200 REM ENTER THREE FOOD CHOICES
210 PRINT "  HELLO! PLEASE ENTER YOUR NAME AND"
220 PRINT "PRESS <RETURN>.":INPUT N$
230 PRINT:PRINT "  THANK YOU, ";N$;"."
240 PRINT:PRINT "  IN A MOMENT, I WILL SHOW YOU A LIST"
250 PRINT "OF BREAKFAST FOODS. CHOOSE THREE FOODS"
260 PRINT "FROM THE LIST."
270 PRINT:PRINT "  YOU WILL RECEIVE POINTS FOR CHOOSING"
280 PRINT "FOODS THAT ARE BALANCED IN THE FOUR"
290 PRINT "FOOD GROUPS AND THAT ARE NUTRITIOUS."
300 PRINT:PRINT "  PRESS <RETURN> TO START.":INPUT Z$
310 GOSUB 1500
320 PRINT:PRINT "  ENTER THE NUMBER OF YOUR CHOICE"
330 PRINT "(1-";F;") FOR FOOD #1. PRESS <RETURN>."
340 INPUT X:IF X < 1 OR X > F THEN 340
350 GOSUB 1500
360 PRINT:PRINT "  ENTER THE NUMBER OF YOUR CHOICE"
370 PRINT "(1-";F;") FOR FOOD #2. PRESS <RETURN>."
380 INPUT Y:IF Y < 1 OR Y > F THEN 380
390 GOSUB 1500
400 PRINT:PRINT "  ENTER THE NUMBER OF YOUR CHOICE"
410 PRINT "(1-";F;") FOR FOOD #3. PRESS <RETURN>."
420 INPUT Z:IF Z < 1 OR Z > F THEN 420
430 REM CALCULATE CALORIES, FOOD GROUPS, SCORE
440 TC = C(X)+C(Y)+C(Z):REM TOTAL CALORIES
450 TM = MT(X)+MT(Y)+MT(Z):REM MEAT GROUP
460 TD = DP(X)+DP(Y)+DP(Z):REM DAIRY GROUP
470 TB = BR(X)+BR(Y)+BR(Z):REM BREAD GROUP
480 TF = FV(X)+FV(Y)+FV(Z):REM FRUIT/VEGETABLE GROUP
490 TS = SC(X)+SC(Y)+SC(Z):REM TOTAL SCORE
500 IF TM > 0 THEN FG = FG+1:REM FG=FOOD GROUPS
510 IF TD > 0 THEN FG = FG+1
520 IF TB > 0 THEN FG = FG+1
530 IF TF > 0 THEN FG = FG+1
540 IF FG = 4 THEN TS = TS+100:REM FOOD IN FOUR GROUPS
550 IF FG = 3 THEN TS = TS+50:REM FOOD IN THREE GROUPS
560 IF FG = 2 THEN TS = TS+10:REM FOOD IN TWO GROUPS
570 REM PRINT OR DISPLAY NUTRITION REPORT?
580 HOME:PRINT "  NOW, I WILL GIVE YOU A NUTRITION"
590 PRINT "REPORT BASED ON YOUR FOOD CHOICES."
600 PRINT "WHICH WOULD YOU PREFER, ";N$;"?"
610 PRINT:PRINT "  1  READ THE REPORT ON THE SCREEN."
620 PRINT:PRINT "  2  PRINT OUT THE REPORT ON PAPER."
630 PRINT "(YOU NEED A PRINTER ATTACHED TO YOUR"
640 PRINT "COMPUTER TO DO THIS.)"
650 PRINT:PRINT "  ENTER '1' OR '2' AND PRESS <RETURN>."
660 INPUT Q$:IF Q$ <> "1" AND Q$ <> "2" THEN 660
670 IF Q$ = "2" THEN GOSUB 20000
680 REM NUTRITION REPORT
690 HOME:PRINT "     ***** NUTRITION REPORT *****"
700 PRINT:PRINT "PREPARED FOR: ";N$
710 PRINT:PRINT "FOODS SELECTED:"
720 PRINT "     ";FI$(X)
730 PRINT "     ";FI$(Y)
740 PRINT "     ";FI$(Z)
750 PRINT:PRINT "TOTAL SCORE (500 POSSIBLE): ";TS
760 PRINT:PRINT "  ";N$;", YOU HAVE CHOSEN FOODS IN
770 PRINT FG;" OUT OF THE 4 BASIC FOOD GROUPS."
780 IF FG <> 4 THEN PRINT:PRINT "  NEXT TIME, CHOOSE
    SOMETHING IN THE:"
790 IF TM = 0 THEN PRINT "     MEAT GROUP"
800 IF TD = 0 THEN PRINT "     DAIRY GROUP"
810 IF TB = 0 THEN PRINT "     BREAD AND CEREAL GROUP"
820 IF TF = 0 THEN PRINT "     FRUIT AND VEGETABLE GROUP"
830 IF Q$ = "1" THEN PRINT:PRINT "  PRESS <RETURN>."
    :INPUT Z$:HOME
840 PRINT:PRINT "  ";N$;", IF YOU ARE 7 TO 9 YEARS"
850 PRINT "OLD, YOU NEED 2100 CALORIES PER DAY."
860 PRINT "  IF YOU ARE 10 TO 12, YOU NEED 2500"
870 PRINT "CALORIES PER DAY."
880 PRINT:PRINT "  HERE IS A CALORIE BREAKDOWN FOR THE"
890 PRINT "FOODS YOU SELECTED:"
900 PRINT: PRINT "NAME OF FOOD ITEM","CALORIES"
910 PRINT "----------------------------------------"
920 PRINT FI$(X),C(X)
930 PRINT FI$(Y),C(Y)
940 PRINT FI$(Z),C(Z)
```

```
 950 PRINT "----------------------------------------"
 960 PRINT "TOTAL # OF CALORIES",TC
 970 IF Q$ = "1" THEN PRINT:PRINT "  PRESS <RETURN>."
     :INPUT Z$:HOME
 980 PRINT "ADDITIONAL FOOD FACTS:"
 990 ON X GOSUB 2000,3000,4000,5000,6000,7000,8000,90
     00,10000,11000,12000,13000
1000 ON Y GOSUB 2000,3000,4000,5000,6000,7000,8000,90
     00,10000,11000,12000,13000
1010 ON Z GOSUB 2000,3000,4000,5000,6000,7000,8000,90
     00,10000,11000,12000,13000
1020 PR# 0:PRINT:PRINT "  BON APPETIT, ";N$;"....":END
1500 REM LIST OF FOOD
1510 HOME:PRINT "  HERE IS THE LIST OF FOOD ITEMS."
1520 PRINT "WHAT'S FOR BREAKFAST, ";N$;"?"
1530 PRINT
1540 FOR I = 1 TO F
1550 PRINT "   ";I;"  ";FI$(I);"."
1560 NEXT I
1570 RETURN
2000 REM EGGS
2010 PRINT:PRINT "  EGGS HAVE A LOT OF PROTEIN. BUT THEY"
2020 PRINT "ALSO HAVE CHOLESTEROL, WHICH MIGHT LEAD"
2030 PRINT "TO HEART PROBLEMS."
2040 PRINT "  POACHED OR BOILED EGGS ARE BETTER FOR"
2050 PRINT "YOU THAN SCRAMBLED OR FRIED EGGS."
2060 RETURN
3000 REM HASH BROWNS
3010 PRINT:PRINT "  HASH BROWNS ARE A GOOD CHOICE, BUT"
3020 PRINT "THEY HAVE A LOT OF FAT FROM FRYING."
3030 PRINT "  STEAMED, BOILED, OR BAKED POTATOES"
3040 PRINT "(WITHOUT BUTTER) ARE BETTER FOR YOU."
3050 RETURN
4000 REM PANCAKES
4010 PRINT:PRINT "  PANCAKES ARE A PRETTY GOOD CHOICE,"
4020 PRINT "BUT GO EASY ON THE SYRUP AND BUTTER."
4030 RETURN
5000 REM PUFFED RICE CEREAL
5010 PRINT:PRINT "  MOST PUFFED CEREALS ARE HIGH IN VITA-"
5020 PRINT "MINS, BUT THEY ALSO CONTAIN UP TO 40"
5030 PRINT "PERCENT SUGAR."
5040 PRINT "  READ THE INGREDIENTS ON THE BOX."
5050 PRINT "AVOID SUGAR, PRESERVATIVES, AND ARTIFI-"
5060 PRINT "CIAL COLORINGS AND FLAVORINGS."
5070 RETURN
6000 REM BRAN/FRUIT CEREAL
6010 PRINT:PRINT "  BRAN CEREAL WITH FRUIT IS A GREAT "
6020 PRINT "CHOICE. IT HAS VITAMINS AND FIBER,"
6030 PRINT "WHICH IS GOOD FOR DIGESTION."
6040 PRINT "  SOME BRAN CEREALS ARE BETTER THAN"
6050 PRINT "OTHERS. READ THE INGREDIENTS ON THE"
6060 PRINT "BOX. AVOID SUGAR AND ARTIFICIAL COLOR-"
6070 PRINT "INGS AND FLAVORINGS."
6080 RETURN
7000 REM BACON
7010 PRINT:PRINT "  BACON HAS PROTEIN. BUT, LIKE HOT DOGS"
7020 PRINT "AND SAUSAGES, IT HAS A LOT OF FAT AND"
7030 PRINT "A CHEMICAL CALLED SODIUM NITRATE."
7040 RETURN
8000 REM TOAST
8010 PRINT:PRINT "  TOAST HAS MANY NEEDED VITAMINS."
8020 PRINT "IN GENERAL, RYE TOAST AND WHEAT TOAST"
8030 PRINT "ARE BETTER FOR YOU THAN WHITE TOAST."
8040 PRINT "  GO EASY ON THE BUTTER AND JAM."
8050 RETURN
9000 REM SODA POP
9010 PRINT:PRINT "  SODA POP HAS A LOT OF SUGAR AND NO"
9020 PRINT "NUTRIONAL VALUE."
9030 PRINT "  READ THE INGREDIENTS ON THE BOTTLE."
9040 PRINT "AVOID CAFFEINE, SUGAR, AND ARTIFICIAL"
9050 PRINT "COLORINGS AND SWEETENERS."
9060 RETURN
10000 REM ORANGE DRINK
10010 PRINT:PRINT "  ORANGE 'DRINK' IS DIFFERENT FROM"
10020 PRINT "ORANGE 'JUICE'. IT HAS LITTLE OR NO"
10030 PRINT "REAL JUICE. MANY FRUIT DRINKS ALSO HAVE"
10040 PRINT "A LOT OF SUGAR."
10050 PRINT "  READ THE INGREDIENTS ON THE PACKAGE."
10060 PRINT "REAL ORANGE JUICE SAYS '100% ORANGE"
10070 PRINT "JUICE' AND NOTHING ELSE."
10080 RETURN
11000 REM TOMATO JUICE
11010 PRINT:PRINT "  TOMATO JUICE IS AN EXCELLENT CHOICE"
11020 PRINT "BECAUSE IT IS HIGH IN VITAMINS AND LOW"
11030 PRINT "IN CALORIES AND SUGAR."
11040 RETURN
12000 REM JELLO
12010 PRINT:PRINT "  JELLO HAS A LOT OF SUGAR AND LITTLE"
12020 PRINT "OR NO NUTRITIONAL VALUE. READ THE IN-"
12030 PRINT "GREDIENTS ON THE PACKAGE. AVOID ARTIFI-"
12040 PRINT "CIAL COLORINGS AND FLAVORINGS."
12050 RETURN
13000 REM PASTRY
13010 PRINT:PRINT "  PASTRIES, INCLUDING DOUGHNUTS, ARE"
13020 PRINT "HIGH IN SUGAR AND HAVE FEW VITAMINS OR"
13030 PRINT "OTHER NUTRIENTS."
13040 RETURN
20000 REM PRINT OUT NUTRITION REPORT
20010 PRINT:PRINT "  MAKE SURE YOUR PRINTER IS TURNED ON"
20020 PRINT "AND THE PAPER IS IN PLACE."
20030 PRINT "  IF YOU DON'T WANT TO PRINT OUT THE"
20040 PRINT "REPORT AFTER ALL, TYPE 'Q' AND PRESS."
20050 PRINT "<RETURN>."
20060 PRINT "  IF EVERYTHING IS READY, PRESS"
20070 PRINT "<RETURN> TO BEGIN PRINTING."
20080 INPUT Z$:IF Z$ <> "Q" THEN PR# 1
20090 IF Z$ = "Q" THEN Q$ = "1"
20100 RETURN
```

SUPER SPELLING GAMES

How to use the word processor to turn your class into spelling superkids!

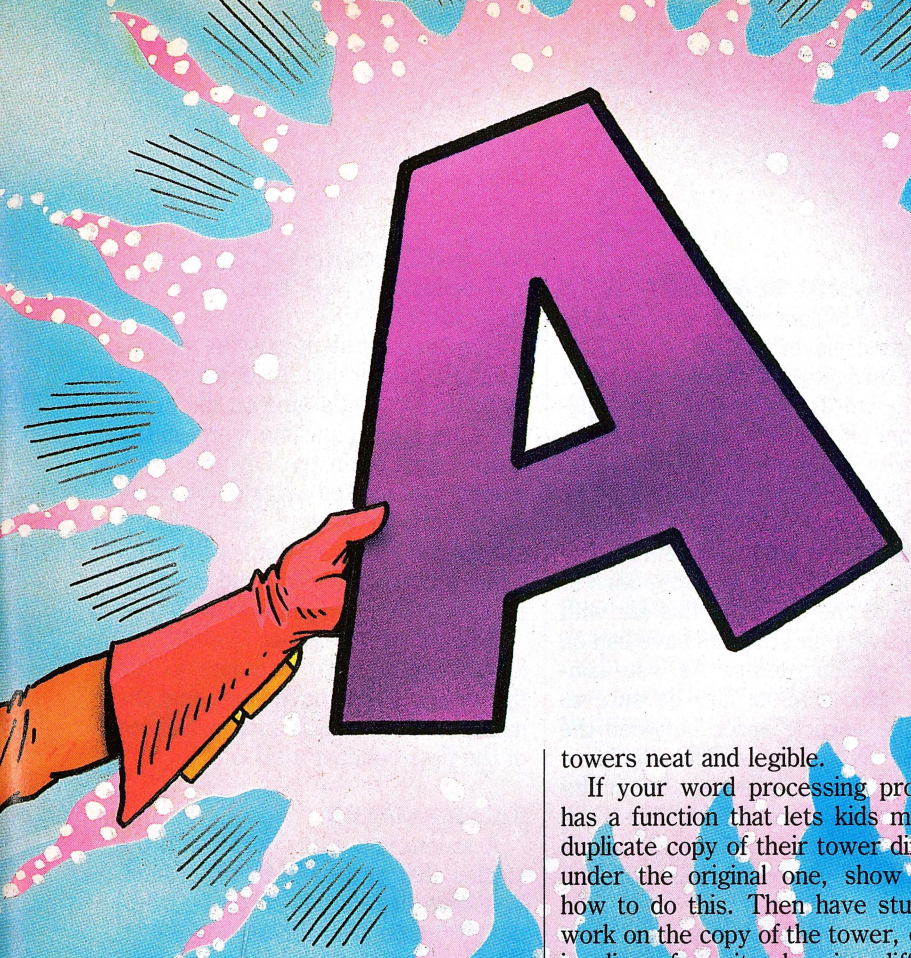
BY MICHAEL N. MILONE

Faster than a SPEAK AND SPELL machine, as accurate as a WEBSTER'S DICTIONARY, able to build a WORD TOWER in a single spelling period. . .that will be your class after it acquires the power of super spelling.

The following activities help build that power by using the word processor to play four popular spelling games. Kids have played these games for years with a pencil and paper, but there are many benefits to using the word processor instead, not least of which is the fact that you eliminate messy crossouts, many arguments over scorekeeping, and the need for lots of paper. Also, it's easy to play the games again and again. When one game is over and a student is ready to begin a new game, simply store the old game, reload your game disk, and start afresh. What could be more super!?

To play the four games, you will need a word processing program that can SAVE, REMOVE, MOVE, SEARCH, REPLACE, and INSERT text. Once you have your software on hand, read the teaching notes on the following pages. They will tell you how to play the games and how to use your word processing software to create the necessary data files for each.

You may find it helpful to train a "game master" to help others with general computer and word processing procedures.



1. WORD TOWER

Word Tower is a popular pen-and-pencil activity that is much more effective when played on the computer. Students get a better visual image of the tower as they build it on the computer screen, because they have an easier time correcting, changing, and spacing letters. They can play Word Tower alone, in small groups, or can compete in large teams.

Children start with one letter, which serves as their tower's peak. They then "build" the tower in rows, from the top down, by adding one additional letter per row to the original letter, either in front of it or behind it. The letters on each row, except the top row, must spell a word (see illustrations that follow). All of the words must be spelled correctly and found in a standard dictionary. The student who constructs the largest tower of words wins.

For the best game results, have all of your children start their towers with the same letter. This prevents complaints from students who might say that they "started with a harder letter than everyone else."

Have students leave spaces between letters, as shown in the samples that follow. This keeps the towers neat and legible.

If your word processing program has a function that lets kids make a duplicate copy of their tower directly under the original one, show them how to do this. Then have students work on the copy of the tower, deleting lines from it, choosing different letters to create new words, and generally improving upon the tower, to see if they can make it longer than the original.

When a student has completed a word tower, have him or her store it under an original file name, or print it out. When everyone has had a chance to do one, compare all the towers in the class. Have the class work together to expand the largest tower even further. Then post it on your classroom bulletin board.

Here are three sample towers.

```
        T
      T   O
    T   O   N
  T   O   N   E
S   T   O   N   E
```

```
            M
          M   E
        M   E   N
      A   M   E   N
    A   M   E   N   D
```

```
        A
      A   T
    A   T   E
  R   A   T   E
R   A   N   T   E   D
```

2. DERIVE

Derive is a game that challenges students to create little words from letters found in a big word. The game can be played by individuals, in small groups, or by large teams. It encourages kids to carefully examine how prefixes, suffixes, compound words, and word roots are used together to spell larger words.

To set up a game of Derive, load your word processing software and enter a single long word (at least eight letters long) into the computer. Save the word in a file, using a name *derived* from letters in the word. For example, store the word *yesterday* in a file named YSTRDY.

When students call up a file like YSTRDY, ask them if they can think of smaller words that use only letters found in the long word. (The order of the letters used does not have to match the order of the letters in the larger word.) Have the students type in their smaller words below the long word already in the file. All smaller words should be ones that can be found in a standard dictionary.

Students need not complete the activity at one sitting. Often they will come up with more words if they work on a file during several short periods of time. Have students save the file on which they are working under a file name that contains the original file name plus a special number that no one else is using. For example, YSTRDY3.

When students or teams believe they have found all the words they can, print out their files and compare their lists of words. The winning student or team is the one that has found the most words (spelled correctly, of course!).

(continued)

Ron Zalme

You might want to have a student create a master file of all the small words found for a specific large word. Then, after several weeks, have the class come back to this file to see if it can find even more words.

Following is a sample data file to get you and the class started. Save it under the file name YSTRDY.

YSTRDY DATA FILE

How many small words can you make, or *derive,* from the long word listed below? Use only the letters in the big word.

All words that you use must be spelled correctly and listed in your classroom dictionary.

Two small words are done for you.

YESTERDAY

Smaller words:
yes
steer

3. SPELLING SLALOM

In Spelling Slalom, students try to be the fastest player to "ski" (move the cursor through) an obstacle course of spelling words, correcting any misspellings on the way. Spelling Slalom improves students' spelling skills while giving them practice with the word processor's editing functions.

First, create a SLALOM data file like the one that follows. You may wish to substitute the words in this file with words that your students have had on recent spelling tests. As you construct your SLALOM file, be sure to vary the verticle space between the spelling words, as well as the horizontal distance between them. Include a "start" and "finish" line. You may even want to arrange the words so that only one appears on the screen at a time.

Edit the words so that some contain spelling errors and some do not. Save the "racecourse" under the file name SLALOM.

When you are ready to start your Spelling Slalom competition, load SLALOM into the computer and time each student as he or she runs through the course. The students must "ski" to each word, check its spelling, correct it if necessary, and then cross the finish line.

After each student skis the slalom, print out his or her racecourse and write the student's time on the printout. Check each spelling word on the course. Just as in the Olympics, if a student has missed a "gate" by spelling a word incorrectly, he or she is disqualified. The student with 100-percent correct spelling and the fastest time wins.

Remember to reboot SLALOM before a new student attempts to run the course. If you have a tie, post the names of the winners and, at the end of the day, conduct a ski-off!

SLALOM DATA FILE

A slalom is a race course with obstacles that you have to go around. You have probably seen, or heard of slalom courses in skiing, horse racing, or car racing. Now you are invited to test your ability on a slalom spelling race course.

Set your cursor at the starting gate in the slalom course that follows. Have someone time you so that you know how long it takes you to complete the course. When the timer is ready, "ski" your cursor to the first word. Change any mistakes in the word so that it is spelled correctly. Then move on to the next word. Every word may not have a mistake in it, so be careful!

When you have finished the course, print out your work. Write on your printout the time it took you to complete the course. Then give your paper to your teacher to check. Each time you play Spelling Slalom, see if you can beat your best time.

SUPER SPELLING GAMES

STARTING GATE ( )

BOTTEM

CORECT

SUCCESS

DOLLER

SUGEST

MILLIEN

MIDDLLE

POSSIEBLE

RITTEN

FINISH LINE ( )

4. ANAGRAMS

An anagram is a word puzzle in which words are rearranged into jumbled groups of letters, and players must unscramble them. Cryptographers use anagrams to send coded messages, but students can use anagrams to improve their spelling skills.

To create an ANAGRAM data file, boot up your word processing program. Enter a list of words that you want to use as the basis for your puzzle. These words can come from your class's weekly spelling list, or even from a text chapter your children have been assigned to study. Enter the words in a column, and save the list. This will serve as your anagrams answer key. Store the list under the file name ANAANSW.

Make another copy of this list to serve as the students' electronic anagram worksheet. Use word processing functions to rearrange the letters in the file so that the words are unrecognizable at a glance. Several spaces to the right of each scrambled word, create a row of dashes (one dash per letter in the word). This is where the students will enter their unscrambled answers. Save this list under the file name ANAGRAM.

Explain to the class what anagrams are, and how spies, detectives, and others use them to send coded messages. Then tell the students to decode the words in the ANAGRAM data file. Motivate the class by telling them that the skill of *deciphering*, or decoding these scrambled words, might come in handy some day — one never knows when they'll need to decode a message!

The anagrams in the following ANAGRAM data file spell out a sentence when the decoded words are read from the top of the column to the bottom. The sentence gives some advice about good spelling. Challenge students to figure out what the message is. *(Super spellers like to use the dictionary.)*

Encourage kids to create their own anagram files for others in the class to try.

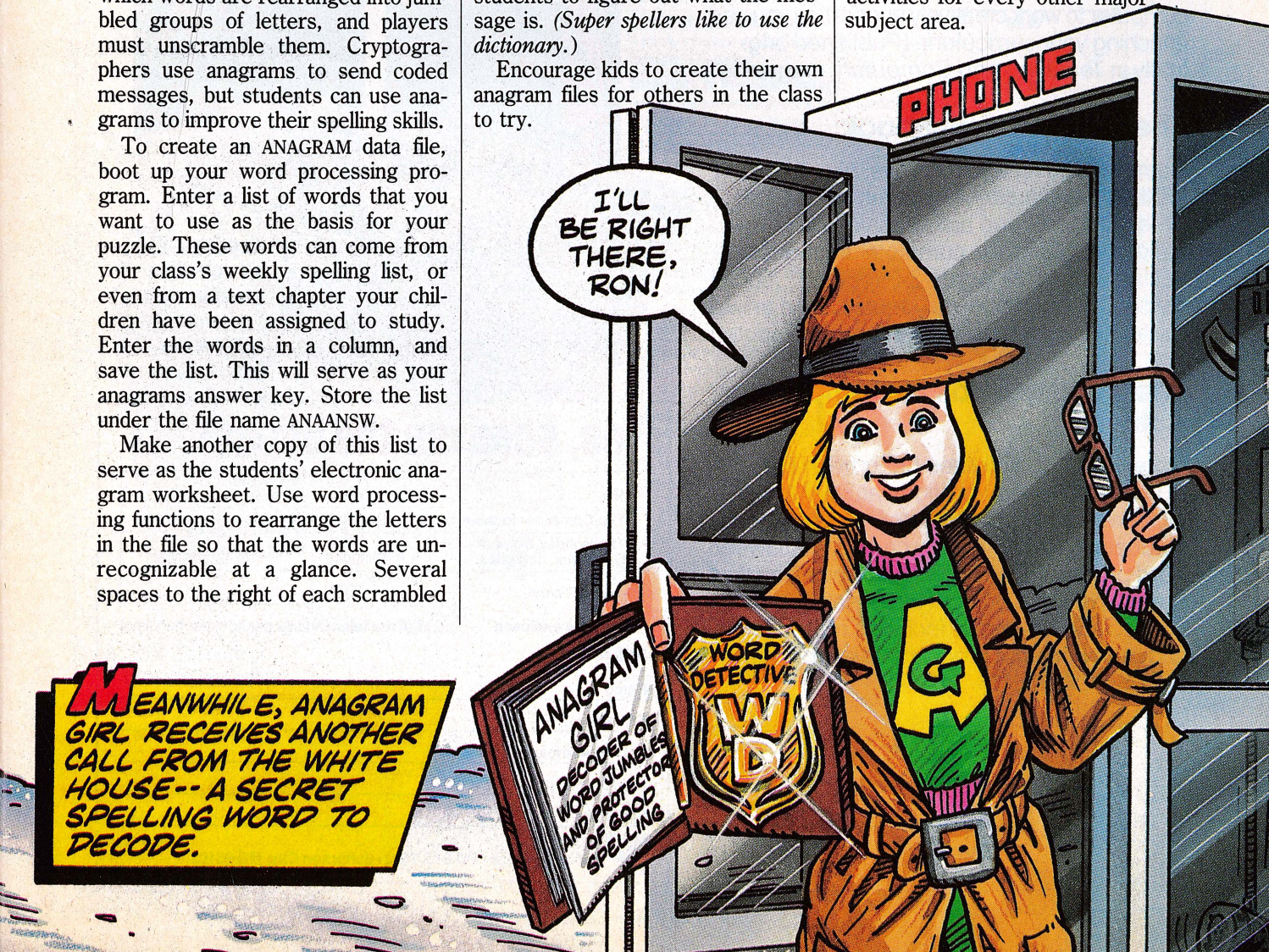
ANAGRAM DATA FILE

Listed below are 12 scrambled words. Unscramble the letters so they spell real words.

PRSUE	- - - - -
ESSLLEPR	- - - - - - - -
ELIK	- - - -
OT	- -
ESU	- - -
ETH	- - -
IRYIDANCTO	- - - - - - - - - -

Read the words in the column from top to bottom. The words spell out a secret message. ■

These spelling games can be found in ***Every Teacher's Guide to Word Processing***, by ***Michael N. Milone, Jr.*** (1985; Prentice-Hall, Inc.; Englewood Cliffs, NJ 07632). The book also contains word processing activities for every other major subject area.



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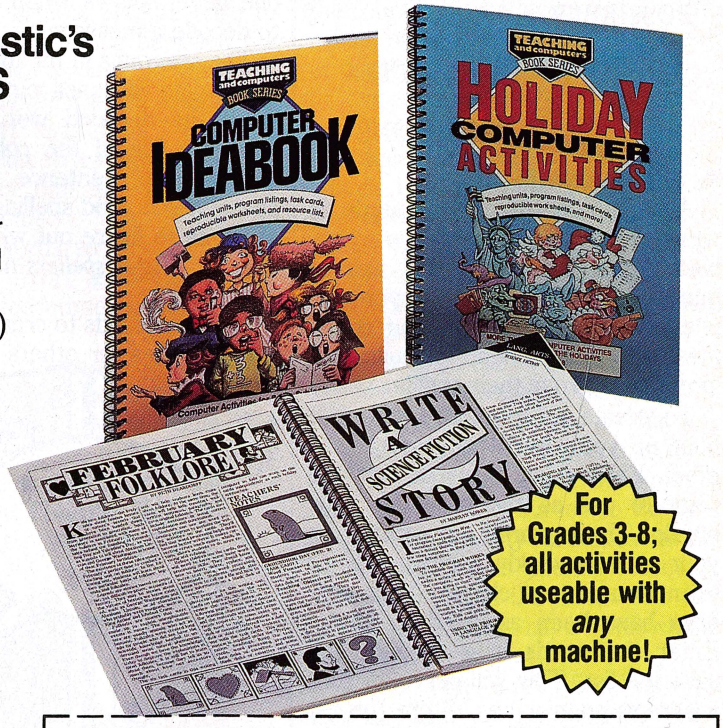

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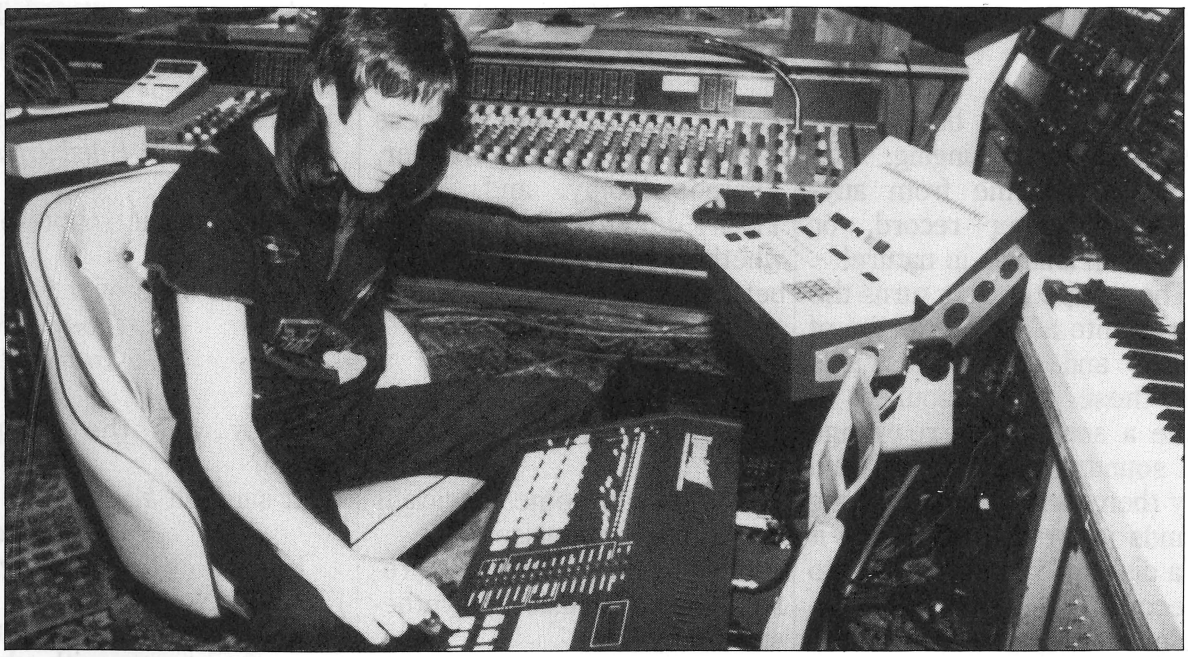
MICRO TIMES™

The mini-magazine for kids who love computers.

Published by Scholastic Inc. April 1986

Make Music With Computers



Lynn Goldsmith/LCI

Rock star Todd Rundgren uses a computerized "synthesizer" to create some of the musical parts on his records. Many musicians use the synthesizer because it plays "perfect" music.

How do you keep the beat without a drum? How do you blow your own horn without a trumpet? You use a machine called a *synthesizer* to make the music!

A synthesizer *(SIN-the-sī-zer)* looks like a small piano keyboard with rows of switches, buttons, and knobs next to it. When you press the keys on the keyboard, the machine makes sounds: beeps, bangs, toots, pings, clanks, chirps, whistles, whooshes, screeches, and kerplunks.

By moving the switches and buttons, you can also make it sound like just about any musical instrument, from a piccolo to a tuba. It can even be made to "sing" in a humanlike voice!

These high-tech music machines have been around for 30 years. But today, they sound less like noise and much more like music than in earlier times. In fact, it's now almost impossible to tell synthesized music

(Continued on next page.)

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Make Music With Computers .. 1,2
Joke File 2
Passover Bread Program Listing .. 3
Micro Puzzle 4

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Written by Lorraine Hopping.

(Continued from page 1.)

Make Music With Computers

from "real" music. Tune in the top 40 on your radio and you'll hear what we mean. Many of the drum parts on these new songs are "synthesized."

Computers play a big role in making synthesizers sound great. They let musicians use a technique called *sampling*. In sampling, a musician uses the computer inside a synthesizer to record sounds, such as instruments playing, birds chirping, and people singing. The sounds can come from anywhere — another record, or even from animals in nature!

The computer then turns the sounds into a code made up of zeroes and ones. Musicians use these coded sounds to make a song. They rearrange the sounds, change them, and play them back. When the song sounds just right, they save it on a disk and later, make it into a record.

Because synthesized music can be changed and reprogrammed, you can use synthesizers to make "perfect" music. Mistakes, such as wrong notes, can be easily edited out.

Some people say, however, that they prefer "human" music, mistakes and all, because it has more energy and feeling.

The next time you're in a record store, listen to the latest songs by artists who use synthesizers. (A few of these artists include Stevie Wonder, Thomas Dolby, and Styx.) Then decide for yourself whether synthesized music is better or not.

Review Questions

1. What is a *synthesizer*?
2. What does *sampling* mean?
3. Why do some musicians like to use synthesizers?
4. Why do some people prefer "human" music to synthesized music?

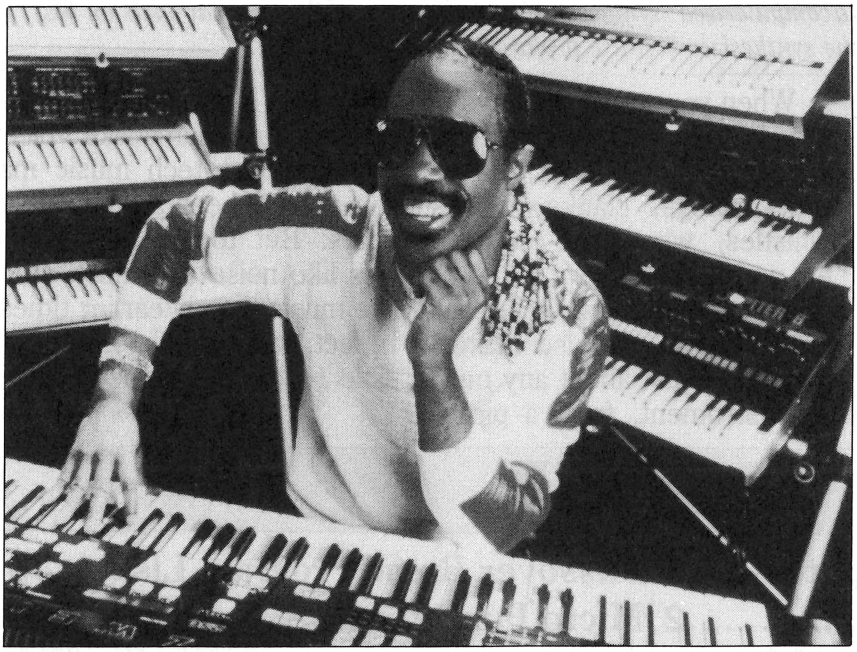


Photo courtesy of Motown

Singer Stevie Wonder also uses the synthesizer to create sounds.

Joke File

Q: What do you call a mail service that works by modem?
A: The Phoney Express.

Carrie Wallis
Pittsburgh, PA

Q: Why was the robot so happy?
A: He was head over wheels in love.

Tony McGinty
Nantucket, MA

Q: Why was the computer booed?
A: It sang off *key*.

Ryan McClendon
Emmitsburg, MD

Q: What do you get when you cross a computer with a horse?
A: Mr. Ed-ison.

Andy Rollins
Louisville, KY

Knock, Knock?
Who's there?
Bolts.
Bolts who?
Bolts of us are nuts!

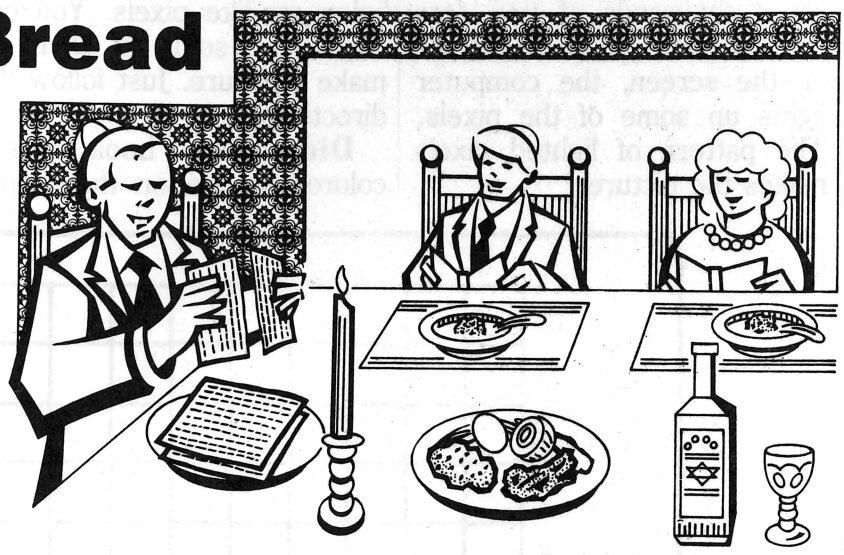
Jennifer Allen
Seattle, WA

Knock, Knock!
Who's there?
Disk.
Disk who?
Disk could be the start of a *boot*iful friend*chip*.

Bill Westin
Atlanta, GA

Program Listing

Passover Bread



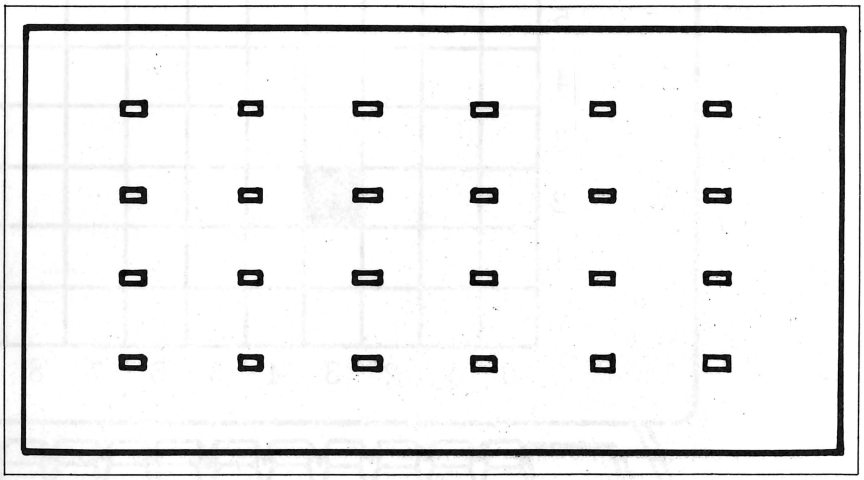
Bill Silbert

Passover is a Jewish holiday that lasts for seven to eight days. It starts on the 15th day of the Hebrew month Nissan. This year, that day falls on April 24th.

During Passover, Jews celebrate the escape of their ancestors, the Israelites, from Egypt. The escape took place more than 3,000 years ago. The Israelites secretly fled from Egypt because the Egyptians had forced them to become slaves.

Jews celebrate Passover with a feast called a Seder (*sād-er*). At the Seder, the story of the Israelites' escape is read aloud. Food that *symbolizes*, or stands for, their flight from Egypt is placed on the table. One of the most important foods is unleavened (flat or unraised) bread called *matzah*. According to the Bible, the Israelites left Egypt in such a hurry that they did not have time to let their bread rise. They made flat, unleavened bread instead.

You can make matzah on the Logo screen.



Use Logo to make a piece of matzah bread. Here's how the matzah looks on a computer screen.

What To Do

1. Load Logo into your computer. (You can use almost any version of Logo.)

2. Type in the following BREAD and HOLE procedures exactly as they appear.

```
TO BREAD
  REPEAT 2 [FD 100 RT 90 FD 139 RT 90]
END

TO HOLE
  REPEAT 10 [FD 1 RT 36]
END
```

3. Type BREAD and press RETURN or ENTER to see the outline of the matzah. Type HOLE and press RETURN or ENTER to see the hole.

4. Combine the BREAD and HOLE procedures into a new procedure called MATZAH. The MATZAH procedure should draw a picture of matzah like the one a picture of a matzah that looks like the one on this page.

Matzah Challenge

During the Seder, the father of the family breaks a piece of matzah in half. He hides one half of the bread somewhere in the house. The first child to find the piece of broken matzah wins a prize.

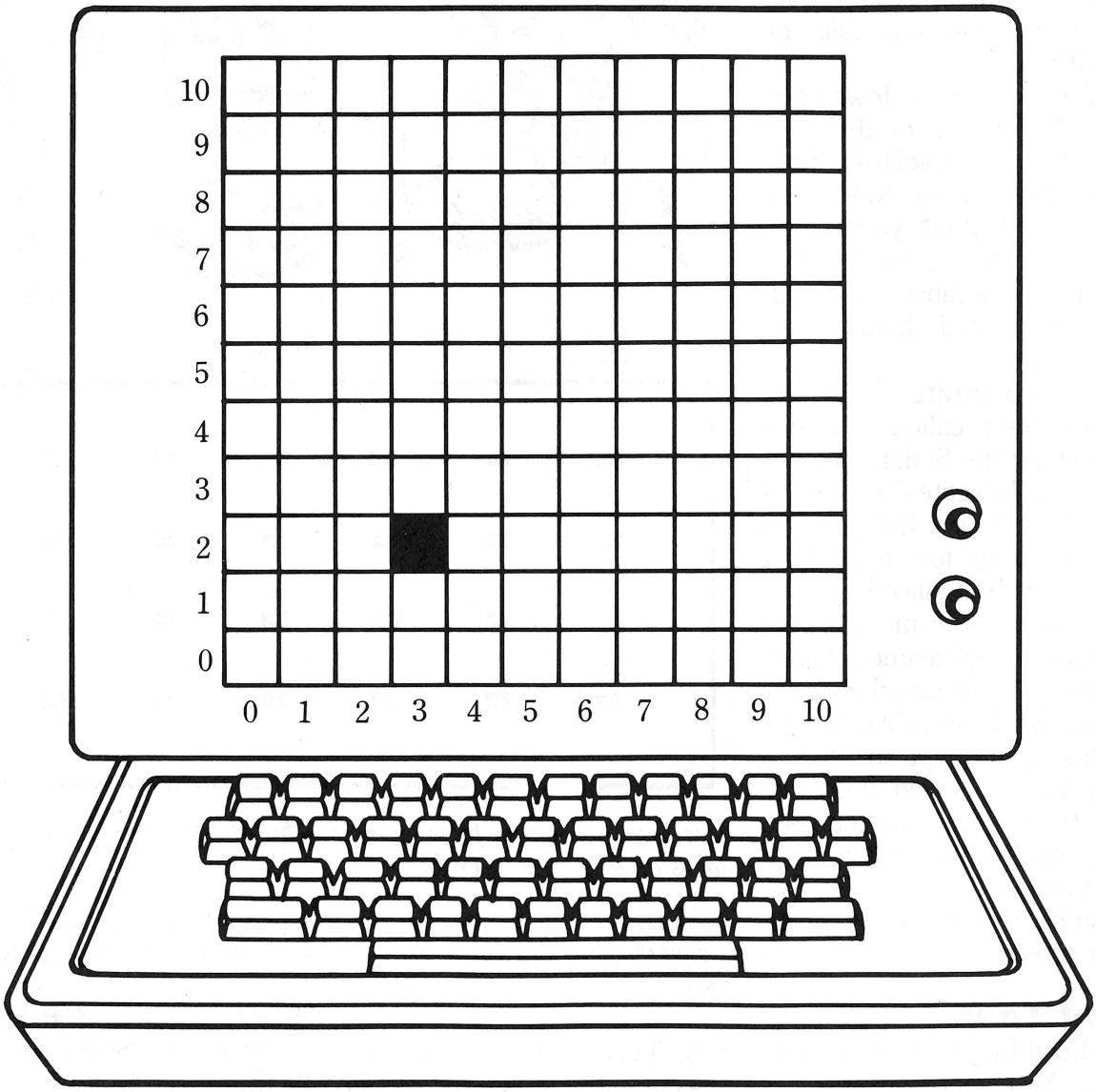
Can you write a procedure that breaks the matzah on the Logo screen exactly in half?

Micro Puzzle

Computer screens are made up of thousands of tiny dots called *pixels*. To make a picture on the screen, the computer lights up some of the pixels. The pattern of lighted pixels makes the picture.

The squares in the grid below are like pixels. You can "light up" some of them to make a picture. Just follow the directions.

Directions: Look at the colored square on the graph. This square is called (3,2). Can you tell why? Now find all the squares listed below. Color each one on the graph. When you're done, you'll have a "drippy" picture that celebrates the month of April!



Color These Squares:

Across	Up
1. 3,	2
2. 3,	1
3. 4,	1
4. 5,	1
5. 5,	2
6. 5,	3
7. 5,	4
8. 5,	5
9. 6,	5
10. 7,	5
11. 8,	5
12. 9,	5
13. 8,	6
14. 7,	7
15. 6,	7
16. 5,	7
17. 5,	8
18. 4,	7
19. 3,	7
20. 2,	6
21. 2,	9
22. 6,	10
23. 8,	9

Answer: See page 58 of your teacher's copy of *Teaching and Computers* magazine.

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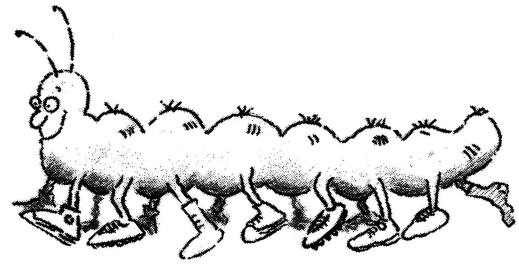
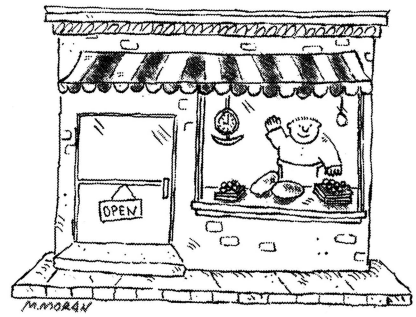
COMPUTER MATCH

Below are four computer words. Draw a line from each word to the funny picture that goes with it.

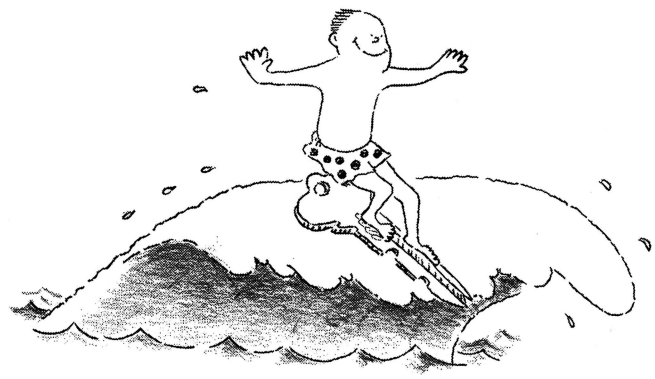
Keyboard



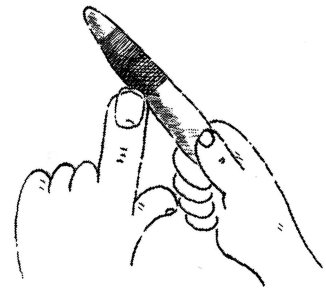
File



Bug



Store



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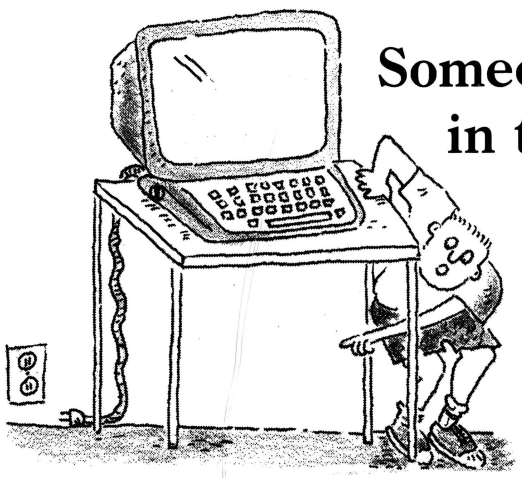
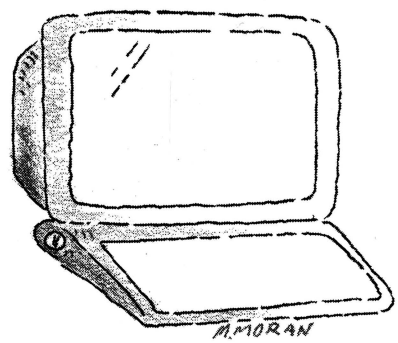
WHAT IS WRONG?

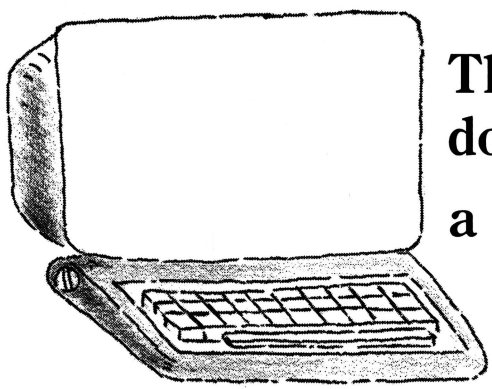
The computers in the pictures do not work. What is wrong with them? For each picture, put an X on what is wrong. Then fill the blanks in the sentences. The sentences will tell you what is wrong with each computer.



Someone forgot to _____ in the computer.

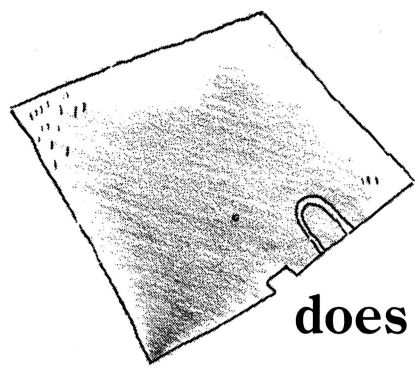
The _____ are missing.





The computer does not have a _____.

WORD BOX
keys
hole
plug
screen



This disk does not have a _____.

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WORD SCRAMBLE

There are many words that have a special meaning for people who use computers. Some of them are printed below, but their letters are all mixed up. Can you unscramble them? The definition next to each word will give you a hint. The first one is done for you.

1.	COORMPRETIMCU	MICROCOMPUTER	A small computer, about the size of a typewriter.
2.	YKDOABRE	_____	The part of a computer that acts like a typewriter.
3.	TAAD	_____	Information you give a computer.
4.	FRATEWOS	_____	Can be another word for *program*.
5.	UBG	_____	A programming mistake.
6.	DRIETCOYR	_____	A list of everything stored on a disk.
7.	MMRGARPOER	_____	A person who writes computer instructions.
8.	DOLA	_____	To move a file or program information from a piece of software to the computer.
9.	URCOSR	_____	The flashing mark on the screen that shows where your next keystroke will appear.
10.	YMMERO	_____	Where a computer stores data.
11.	CAKPUB	_____	A spare copy of a disk.
12.	YKISTCOJ	_____	A piece of hardware most often used when playing games.
13.	EOMMD	_____	Used to connect a computer to telephone lines.
14.	ORMNITO	_____	Another name for a computer screen.
15.	NOITPRUT	_____	What you get from a printer.

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CHANGE INTO BASIC

A computer that speaks only BASIC will not understand the words below. Help the computer understand. For each example, write a BASIC word that means the same thing.

1. STOP _____ _____ _____
2. WRITE _____ _____ _____ _____ _____
3. KEEP _____ _____ _____ _____
4. UNUSED _____ _____ _____
5. SPRINT _____ _____ _____
6. FILL _____ _____ _____ _____
7. RESIDENCE _____ _____ _____ _____
8. REVISIT _____ _____ _____ _____ _____ _____
9. SUMMON _____ _____ _____ _____
10. FUNDAMENTAL _____ _____ _____ _____ _____
11. WHETHER _____ _____
12. GO IN _____ _____ _____ _____ _____
13. ALLOW _____ _____ _____
14. FOLLOWING _____ _____ _____ _____
15. TRAVEL TO _____ _____ _____ _____

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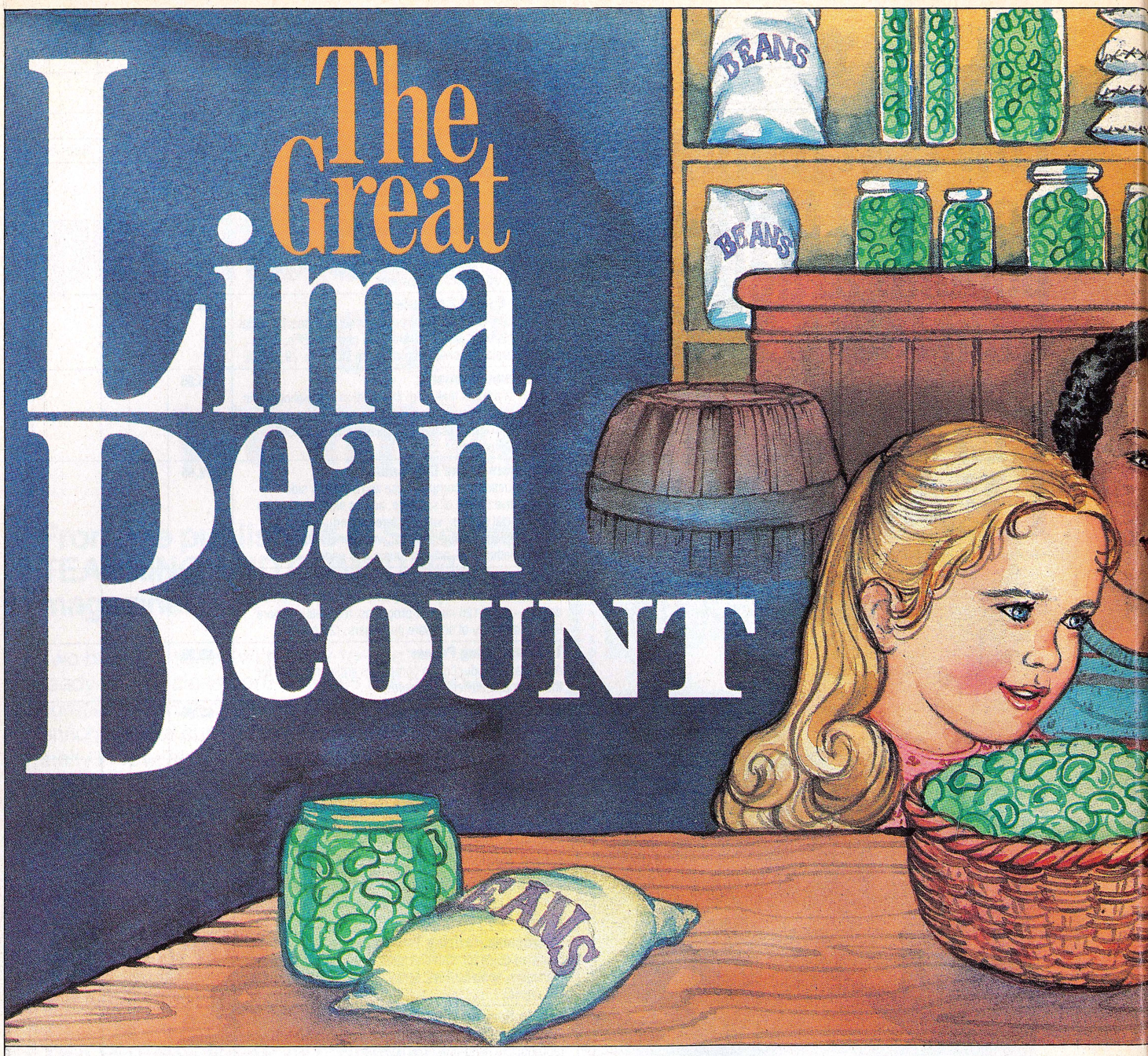
The Great Lima Bean Count



YOU CAN TEACH KIDS HOW TO ESTIMATE POPULATIONS WITH THE HELP OF A JAR, A COMPUTER, AND 100 DRIED BEANS!

How do we determine the number of people that live in a given area? One way is to take a *census*, or complete head count. That's what the U.S. government is required to do every five years to determine the population of our country. It locates every citizen, directly or indirectly, and adds him or her into the count.

Discuss the U.S. census with your students. Tell them that the method used by the U.S. government to count people can be used to count populations of plants and other animals, too. To encourage your students to think about the difficulties involved in such a count, ask them to consider how they would take a census of all the students at your school who own dogs. One way would be to contact every student and ask how many have dogs at home, then add the results to get the total number of students with dogs. This method would provide a fairly accurate result, but it might not be the most practical way to count the population. Ask students to name some problems they might encounter with this method. *(It is very time consuming. Some students may be absent the day of the survey.)*

Sometimes it's nearly impossible to do a complete head count of populations, such as those of animals in the wild. For example, there is no easy way to locate all the fish in an ocean. Besides, counting fish one by one would take too much time. Tell students that there are other ways to count populations that are easier and take less time. Rather than locate every person, plant, or animal in a particular population, one can survey a part of the population

Barbara Lanza

called a *sample*. For example, the students in your class are a sample of the student population at your school. Students can study this sample to get information about the entire population. This method of estimating populations is called *sampling*.

To demonstrate how sampling works, count the number of students in your class who own dogs, then use the results of the sample survey to estimate how many students at your school own dogs. Here's how. Suppose 12 of the 24 students in your class own dogs. This is half the class. We could estimate that half the students in the school own dogs. Then, if we know the number of students in the school, we can estimate the total number of dog owners by dividing that number by two. For example, if there are 500 students in the school, we can estimate that there are 250 dog owners.

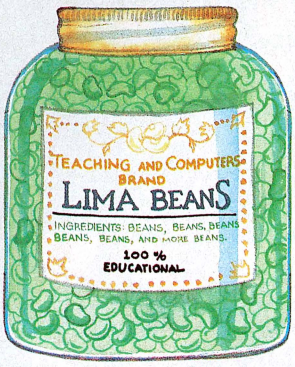
Try this with your class. Then check the effectiveness by doing an actual head count. Have your class survey all the students in the school, record the number of students that own dogs, and add the numbers together. Ask students to compare their estimates from the sample population with the survey results. How close are their estimates? The sampling method saves time, but it may not be as accurate as we would like. Perhaps your class is unusual, and the students have more total dogs than other classes.

The sampling method used to estimate your school's dog population would not be helpful for counting some wildlife populations. Ask students to name some animal populations that would be difficult to count this way. For example, suppose we were trying to count whales in the ocean. Because whales move to different locations in the ocean and can only be seen when they are on the surface of the water, the same whale

(continued)

By Susan Friel

Lima Bean Count



may be counted several times — unless there was a way to tell one whale from another. Also, we can't know what proportion of the total whale population we see at any one time.

Tell students that scientists have developed a sampling method for estimating wildlife populations that are difficult to count, such as fish and birds. The method is called *capture-recapture*. First, they "capture" a sample of the population and figure out how they might be able to recognize each individual animal if they spot it again. Scientists can identify some animals by natural markings, such as fluke markings on humpback whales. In the cases of other animal species who are not easily identified, scientists often tag those captured with a special type of marker. Then the animals are released.

Later, as more samples are captured, any animals from the original sample (who were previously identified or tagged) are considered "recaptured." Scientists record the number of recaptured animals in each sample. They have derived a mathematical formula that lets them use the average number of recaptured animals in their samples to guess the general size of the entire population.

Like scientists, students can use the capture-recapture method to estimate populations. In the following four activities, students use capture-recapture to estimate populations of dried beans. For the first activity, they estimate the number of dried beans in a jar by using data they collect from samples. In activity two, they use a BASIC computer program called *Bean Counter* to recalculate their bean population estimates on computer. In activities three and four, students use the *Bean Counter* program again to explore other variables that affect population estimates.

Activity #1:

Counting Beans By Hand

Objective: Students estimate the number of dried beans in a jar by using the capture-recapture method and data they collect by hand.

Supplies: You will need one glass jar (wide-mouthed jars work best) for each team of two or three students, white or light-colored dried lima beans (enough to fill each jar with between 75 and 100 beans), and a felt-tipped permanent marker for each team.

Preparation: Pour between 75 and 100 dried beans into each jar. (Keep the exact count unknown for each.) Divide your class into teams of two or three students. Copy the worksheet on page 43 and distribute one to each student. Give each team a jar of dried beans and felt-tipped marker.

Tell students to pick 10 beans from their jar and color both sides of each bean with their felt-tipped marker. On their worksheet, have students record "10" next to NUMBER OF BEANS MARKED IN THE JAR. (See completed worksheet at right.) Return the beans to the jar.

Tell kids they are now ready to do eight sample bean counts. Begin by having each team shake its jar to mix up the beans, and then remove 15 beans. Tell children to record "15" under the worksheet column marked NUMBER OF BEANS IN SAMPLE in the SAMPLE 1 row. Have them count the number of marked beans in their sample and record this information under NUMBER OF BEANS MARKED for SAMPLE 1. For example, in the completed worksheet on this page, there were 2 marked beans recorded in the first sample of 15 beans.

Students should shake the jar again and count the number of marked beans in the second sample of 15 beans. Tell them to record this information in the appropriate columns on their worksheets. Have them repeat the process six more times, each time recording the number of marked beans and the number of beans in the sample (always 15).

Once eight samples have been counted and recorded, ask students to add the numbers in the NUMBER OF BEANS MARKED column and write the sum next to TOTAL (16 on the sample worksheet). Now have students record 15 next to the NUMBER OF BEANS IN EACH SAMPLE and 8 next to NUMBER OF SAMPLES TAKEN.

Have students calculate the AVERAGE NUMBER OF BEANS MARKED by dividing the TOTAL NUMBER OF BEANS MARKED (16 on the sample worksheet) by the NUMBER OF SAMPLES TAKEN (8). In the worksheet example, the result is 2.

To determine the ESTIMATED NUMBER OF BEANS IN THE JAR, students use a special formula in which they multiply the NUMBER OF BEANS MARKED (10) by the NUMBER OF BEANS IN EACH SAMPLE (15) and divide the total by the AVERAGE NUMBER OF BEANS MARKED (2 on the sample worksheet). Advanced students may wish to examine how this formula was derived, but most children will not be ready to understand the math concepts involved. Simply tell them that this is the formula population estimators use.

Once students have arrived at this estimate, have them count the beans in the jar and record the actual number next to ACTUAL NUMBER OF BEANS IN THE JAR on their worksheets. Ask students to compare their ESTIMATED NUMBER OF BEANS IN THE JAR with the ACTUAL NUMBER OF BEANS IN THE JAR. How close are their estimates to the actual bean populations?

Although the two numbers may not be identical, they should be close

enough to demonstrate the value of the capture-recapture method. Tell students that scientists use this method to determine wildlife populations which, unlike dried beans in a jar, cannot be easily collected and counted one by one.

ACTIVITY #2:

Using The *Bean Counter* Program

Objectives: In this activity, students learn that they can use a BASIC computer program to perform the calculations they did by hand in the last activity. They will also learn that it's quicker and easier to let the computer help with the calculations.

Supplies: You will need one computer and the worksheets, page 43, that your students completed in the last activity.

Preparation: Type the following program listing into your computer. (It will run on most major machines.)

```
5 REM BEAN COUNTER
10 REM S = NUMBER OF SAMPLES TO TAKE
20 REM TM = TOTAL NUMBER OF BEANS MARKED IN ALL SAMPLES (TM = TM + M)
30 REM M = NUMBER OF BEANS MARKED IN GIVEN SAMPLE
40 REM BM = NUMBER OF BEANS IN EACH SAMPLE
50 REM AMB = AVERAGE NUMBER OF BEANS MARKED IN ALL SAMPLES (TM / S)
60 REM EP = ESTIMATED POPULATION ((BM * B) / AMB)
70 PRINT "NUMBER OF BEANS MARKED IN JAR: ":INPUT BM
80 PRINT "NUMBER OF BEANS IN EACH SAMPLE: ":INPUT B
90 PRINT "NUMBER OF SAMPLES TO TAKE: ":INPUT S
100 PRINT
110 FOR I = 1 TO S
120 PRINT "BEANS MARKED IN SAMPLE ";I;
130 INPUT M
140 PRINT
150 TM = TM + M
160 NEXT I
170 AMB = TM / S
180 EP = (BM * B) / AMB
190 PRINT
200 PRINT "ESTIMATED NUMBER OF BEANS IN JAR: ";EP
210 END
```

Activity: Now run the program. It asks students to enter data that they recorded on their worksheets in the previous activity. First, they enter the number of marked beans in the jar (10). Next, they enter the number of beans in each sample (15) and the total number of samples (8). Finally, they enter the number of marked beans in each sample from their worksheets. The program uses this data to automatically calculate and report the estimated number of beans in the jar.

Have students compare the value they put for ESTIMATED NUMBER OF BEANS IN THE JAR on their worksheets with the computer program's results. If students performed their calculations correctly, the numbers will be the same. Which calculating method did kids find more efficient, theirs or the computer's?

ACTIVITY #3:

Varying The Number Of Samples

Objective: Students learn that the number of dried bean samples they take influences the accuracy of their population estimates.

Supplies: You will need one computer, the BASIC computer program from the last activity, and the jars of dried beans used in the first activity. Students should have paper and pencils on hand.

Preparation: Divide students into their teams of two or three students. Give each team a jar of beans. (It does not matter if the jar is the one the team used previously.)

Activity: Tell students that they are going to repeat the bean sampling activity four times, each time taking a different number of samples and entering their data in the computer. Remember that 10 beans from each jar have already been marked and returned to the jars.

(continued)

BEAN COUNTER WORKSHEET

NAME: _____

	NUMBER OF BEANS MARKED	NUMBER OF BEANS IN SAMPLE
SAMPLE 1	1	15
SAMPLE 2	1	15
SAMPLE 3	4	15
SAMPLE 4	3	15
SAMPLE 5	2	15
SAMPLE 6	1	15
SAMPLE 7	2	15
SAMPLE 8	2	15
TOTAL	16	

NUMBER OF BEANS MARKED IN THE JAR: 10
NUMBER OF BEANS IN EACH SAMPLE: 15
NUMBER OF SAMPLES TAKEN: 8
AVERAGE NUMBER OF BEANS MARKED: (16/8) = 2
ESTIMATED NUMBER OF BEANS IN THE JAR:
(10 X 15)/2 = 150/2 = 75
ACTUAL NUMBER OF BEANS IN THE JAR: 81

A completed worksheet based on eight samples of the bean population.

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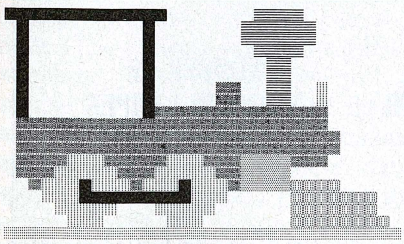

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Lima Bean Count

First, have students take two bean samples (15 beans in each sample) from the jar and record the number of marked beans in each sample on paper. Ask them to run the program and enter the data they collected. They should record the estimated number of beans on paper.

Now have them repeat this process three more times, each time taking two more samples than the last time and recording the estimated number of beans on paper.

Once students have entered their data for eight samples and recorded the estimated number of beans on paper, ask them to count the actual number of beans in their jars. Now have them compare the estimates they recorded on paper with this number. Which estimate is closest to the actual number — the estimate based on two samples or the one based on eight samples? *(The one based on eight samples.)* Students will find that the more samples they take, the closer their estimate is to the actual number of beans in the jar.

Activity #4:

Varying The Number Of Marked Beans In Each Sample

Objective: In this activity, students use the *Bean Counter* program to enter hypothetical data from imaginary jars of beans. By examining the results, they learn that the number of marked beans drawn in each sample provides an indication of the size of the total population.

Supplies: You will need one computer and the *Bean Counter* program from Activity #2. Students should have paper and pencils on hand.

Activity: Ask students to pretend that they have a jar of beans that contains 10 marked beans. Now tell them to imagine that they take eight samples with 15 beans in each sample from the jar. Each sample contains 0, 1, or 2 marked beans.

Have students run the *Bean Counter* program and enter the hypothetical data. They enter "10" for the NUMBER OF BEANS MARKED IN JAR; "15" for the NUMBER OF BEANS IN EACH SAMPLE; and "8" for the NUMBER OF SAMPLES TO TAKE. Tell them to enter either "0", "1", or "2" each time the program asks for the BEANS MARKED IN SAMPLE. Students should record the ESTIMATED NUMBER OF BEANS IN JAR on paper.

Now tell students to imagine they are using a different jar of beans. This jar also contains 10 marked beans. Again, they take eight samples with 15 beans in each sample, but this time each sample contains either 8, 9, or 10 marked beans.

Ask students to run the program again and enter the new data. Each time the program asks for BEANS MARKED IN SAMPLE, they should enter either "8," "9," or "10." Have them record the estimated number of beans on paper.

Now ask students to compare the population estimates from their imaginary jars. If the number of marked beans in several samples is small (as in the first jar), what do we discover about the probable number of beans in the jar? *(It is fairly large.)* What happens if the number of marked beans in several samples is large, as in the second jar? *(The probable number of beans in the jar is smaller.)* From this activity, students deduce that the number of marked beans in each sample helps indicate the general size of the population.

You can apply this lesson to wildlife populations as well. For example, if the population of fish in a pond is very small, scientists are more likely to recapture the same fish again and again. On the other hand, if the population is very large, scientists are less likely to recapture the same fish.

Susan Friel is an associate professor of mathematics and computer science at Lesley College in Cambridge, MA. Susan adapted some of the activities in this unit from teaching materials she helped create for *The Voyage of the Mimi*, a combination video-computer software program developed by Bank Street College.

Circle 19 on Reader Service Card.

NAME _____

Bean Count Worksheet

	NUMBER OF BEANS MARKED	NUMBER OF BEANS IN SAMPLE
SAMPLE 1		
SAMPLE 2		
SAMPLE 3		
SAMPLE 4		
SAMPLE 5		
SAMPLE 6		
SAMPLE 7		
SAMPLE 8		
TOTAL		

Number of beans marked in the jar: _____
Number of beans in each sample: _____
Number of samples taken: _____
Average number of beans marked: _____
(Total number of beans marked/number of samples taken)
Estimated number of beans in the jar: _____
(Number of beans marked x number of beans in each sample/average number of beans marked)
Actual number of beans in the jar: _____

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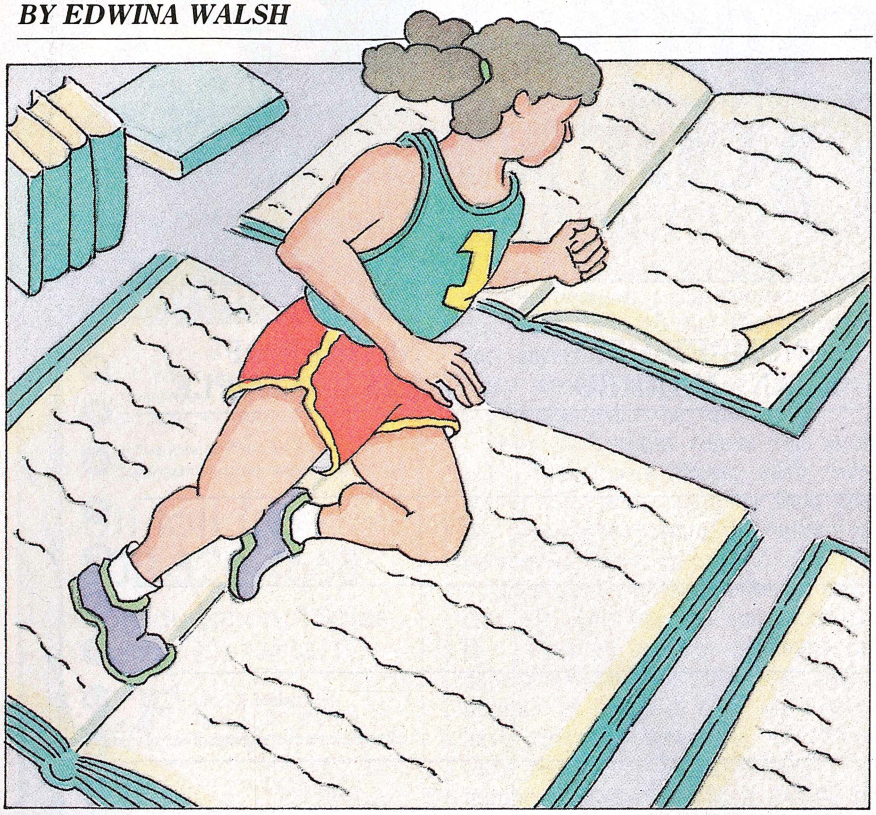
Logo Speed Reader

BY EDWINA WALSH



Logo Speed Reader is a drill and practice program that helps train students to read text more rapidly. The program is suitable for students in grades four through eight.

HOW THE PROGRAM WORKS

In *Logo Speed Reader,* students are first asked to choose a reading speed: top speed, medium speed, or slow speed. The computer then flashes a four-word phrase on the screen for a specific period of time. If students choose "top speed," the phrase stays on the screen for a short period (a few seconds). If they choose "medium speed," it stays on the screen a little longer. And, if they choose "slow speed," the phrase is displayed longer yet.

After the screen clears, the student is asked to type in the phrase. He or she receives five points for each word of the phrase entered correctly. The maximum score is 20 points per phrase.

The computer then displays a running total of the score and continues to the next phrase. There are 10 phrases altogether. The phrases, which were taken from a fifth grade basic reader, include: "when he was fifteen"; "born the first day"; "she felt she had"; "we are almost there"; "the old lady was"; "from inside the house"; "she came toward them"; "I stumbled over that"; "put the cow down"; "the walls were thick."

After the student has responded to the tenth phrase, the computer gives the student's final score out of a possible 200 points.

USING THE PROGRAM IN THE READING CURRICULUM

Some students read more slowly than others because they look at and sound out words individually. You can help these slow readers pick up speed by training them to see phrases instead of individual words. That way, their eyes can pass faster over the text .

The *Logo Speed Reader* program is a step in this direction. It forces students to look at four-word phrases in a group. (If they try to read each word in the phrase separately, they have less chance of seeing or remembering them all, and so receive a lower score on the program.)

Logo Speed Reader also provides practice in spelling; if students misspell a word, it does not count toward the score.

Have students run through the program individually at a speed appropriate to their reading level. (To begin the program, type START and press RETURN or ENTER.) If they score well, tell them to run the program again at a higher speed. If they score below 100, set the speed at a slower level.

To give students additional practice or to adjust the reading level of the program, change the 10 phrases in the program listing. (Use any four-word phrases from your reading text.) To change the phrases, simply replace the words in brackets after the MAKE "L command in the START procedure with your own words. You must put brackets around each phrase and also around the entire list of phrases. Also, the phrases must have four words in them.

Here is an example of an appropriate substitution. (The phrases were taken from a fourth grade reader.)

```
MAKE "L [[THE LIGHTS WENT OUT] [HE KNEW FOR SURE] [WHEN THE PAINT DRIES] [I MUST SHOW THIS] [STOOD AT THE CHALKBOARD] [THEIR MOUTHS WIDE OPEN] [THERE WAS NO REPLY] [HOLES IN THE ICE] [SHE WILL NEVER FORGET] [WAS SCARED TO DEATH]].
```

If you want to include more or less than 10 phrases, you must make two other minor changes. First, change the number 11 in the GAME procedure to one more than the number of phrases in the program. Second, change the number of points possible in the FINISH procedure to 20 times the number of phrases.

Once students are comfortable taking in a phrase of words at a time, they can practice this rapid reading technique on full blocks of text.

Edwina Walsh is a computer coordinator for Walker Junior High School in La Palma, CA.

Michael Donato

PROGRAM LISTING FOR *LOGO SPEED READER*

Directions

This program can be used with Apple, Commodore, Krell, or Terrapin versions of Logo.

To use this program, first load the Logo language disk into your computer. Then enter the procedures for your version of Logo, exactly as they appear. Save the program under an appropriate file name, such as SPEED. To begin the program, type START and press RETURN or ENTER.

Apple Logo Version:

```
TO START
  CLEARTEXT
  MAKE "V 1
  MAKE "SCORE 0
  MAKE "FL 0
  MAKE "L [[WHEN HE WAS FIFTEEN] [BORN THE FIRST DAY] [SHE FELT SHE HAD] [WE ARE ALMOST THERE] [THE OLD LADY WAS] [FROM INSIDE THE HOUSE] [SHE CAME TOWARD THEM] [I STUMBLED OVER THAT] [PUT THE COW DOWN] [THE WALLS WERE THICK]]
  PR [WELCOME TO LOGO SPEED READER!]
  PR [ ]
  PR [DO YOU WANT DIRECTIONS (YES OR NO)?]
  TEST RL = [YES]
  IFT [DIRECTIONS]
  SETSPEED GAME FINISH
END

TO DIRECTIONS
  CLEARTEXT
  PR [A PHRASE WILL FLASH ON THE SCREEN.]
  PR [AFTER IT DISAPPEARS, TYPE IN AS MUCH]
  PR [OF THE PHRASE AS YOU CAN RE MEMBER.]
  PR [ ]
  PR [THE COMPUTER WILL GIVE YOU 5 POINTS]
  PR [FOR EACH WORD ENTERED COR RECTLY.]
  PR [ ]
  PR [PRESS RETURN TO CHOOSE A SPEED.]
  MAKE "NL RC
  TYPE :NL
END

TO SETSPEED
  CLEARTEXT
  PR [HOW FAST CAN YOU READ?]
  PR [ ]
  PR [1. TOP SPEED]
  PR [2. MEDIUM SPEED]
  PR [3. SLOW SPEED]
  PR [ ]
  PR [ENTER 1, 2, OR 3 AND PRESS RE TURN.]
  MAKE "LEV FIRST RL
  PR [ ]
  PR [PRESS RETURN TO BEGIN.]
  TYPE RC CLEARTEXT
END

TO GAME
  PHRASE CHECK ADD.SCORE
  IF :V<11 [GAME]
END

TO PHRASE
  MAKE "X ITEM :V :L
  SETCURSOR [9 8]
  PR :X
  IF :LEV = 1 [WAIT 30]
  IF :LEV = 2 [WAIT 70]
  IF :LEV = 3 [WAIT 95]
END

TO CHECK
  CLEARTEXT PR [ ]
  PR [ENTER THE PHRASE THAT YOU JUST SAW:]
  MAKE "Y RL
  SETCURSOR [0 15]
  IF :Y = :X [TWENTY]
  IF :Y = BF :X [FIFTEEN]
  IF :Y = BL :X [FIFTEEN]
  IF :Y = BF BF :X [TEN]
  IF :Y = BL BL :X [TEN]
  IF :Y = BF BL :X [TEN]
  IF :Y = FIRST :X [FIVE]
  IF :Y = LAST :X [FIVE]
  IF :Y = BF BL BL :X [FIVE]
  IF :Y = BL BF BF :X [FIVE]
  IF :Y = [ ] [ZERO]
  IF :FL = 0 [ZERO]
  MAKE "FL 0
END

TO TWENTY
  PR [EXCELLENT! YOU GOT 20 POINTS.]
  MAKE "SCORE :SCORE+20
  MAKE "FL 1
END

TO FIFTEEN
  PR [GOOD! YOU GOT 15 POINTS.]
  MAKE "SCORE :SCORE+15
  MAKE "FL 1
END

TO TEN
  PR [YOU GOT 10 OUT OF 20 POINTS.]
  MAKE "SCORE :SCORE+10
  MAKE "FL 1
END

TO FIVE
  PR [YOU GOT 5 OUT OF 20 POINTS.]
  MAKE "SCORE :SCORE+5
  MAKE "FL 1
END

TO ZERO
  PR [SORRY! YOU GOT ZERO POINTS.]
  MAKE "FL 1
END

TO ADD.SCORE
  MAKE "V :V+1
  SETCURSOR [0 17]
  PR [TOTAL SCORE =]
  PR :SCORE PR [ ]
  PR [PRESS RETURN TO CONTINUE.]
  TYPE RC CLEARTEXT
END

TO FINISH
  PR [YOUR FINAL SCORE IS:]
  PR :SCORE
  PR [OUT OF 200 POSSIBLE.]
  PR [ ]
  PR [DO YOU WANT TO TRY AGAIN?]
  TEST RL = [YES]
  IFT [START]
  PR [ ] PR [GOODBYE. . . .]
END
```

Commodore, Krell, and Terrapin Logo Versions:

Enter the ZERO, FIVE, TEN, FIFTEEN, and TWENTY procedures from the Apple Logo version. Then enter the following procedures exactly as they appear.

```
TO START
  CLEARTEXT
  MAKE "V 1
  MAKE "SCORE 0
  MAKE "FL 0
  MAKE "L [[WHEN HE WAS FIFTEEN]
```

(continued on page 47)

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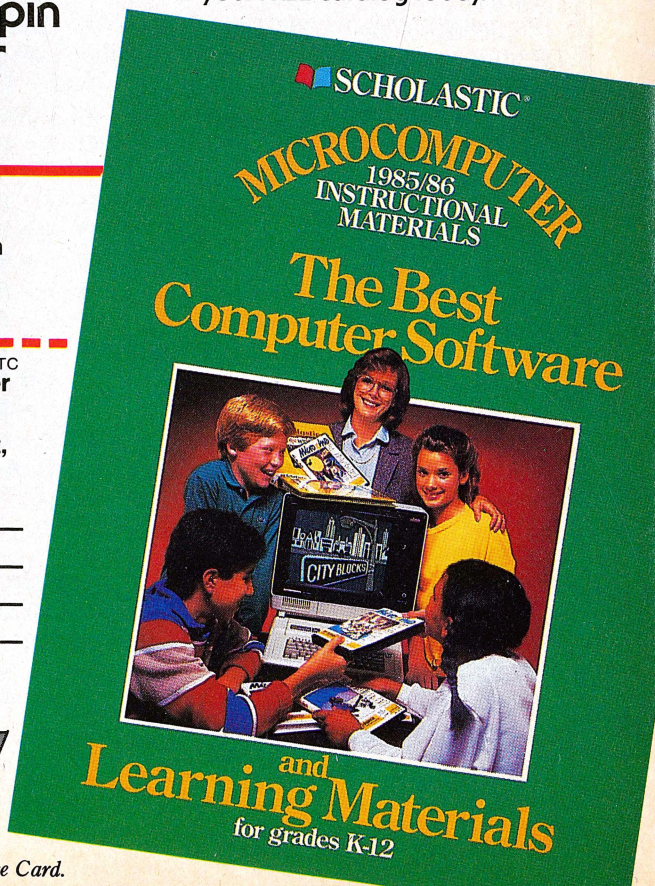

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PROGRAM LISTING FOR *LOGO SPEED READER* *(continued)*

```
[BORN THE FIRST DAY] [SHE FELT SHE
HAD] [WE ARE ALMOST THERE] [THE
OLD LADY WAS] [FROM INSIDE THE
HOUSE] [SHE CAME TOWARD THEM] [I
STUMBLED OVER THAT] [PUT THE COW
DOWN] [THE WALLS WERE THICK]]
  PR [WELCOME TO LOGO SPEED
READER!]
  PR [ ]
  PR [DO YOU WANT DIRECTIONS (YES
OR NO)?]
  TEST RQ = [YES]
  IFT DIRECTIONS
  SETSPEED GAME FINISH
END

TO DIRECTIONS
  CLEARTEXT
  PR [A PHRASE WILL FLASH ON THE
SCREEN.]
  PR [AFTER IT DISAPPEARS, TYPE IN
AS MUCH]
  PR [OF THE PHRASE AS YOU CAN RE
MEMBER.]
  PR [ ]
  PR [THE COMPUTER WILL GIVE YOU 5
POINTS]
  PR [FOR EACH WORD ENTERED COR
RECTLY.]
  PR [ ]
  PR [PRESS RETURN TO CHOOSE A
SPEED.]
  RUN REQUEST
END

TO SETSPEED
  CLEARTEXT
  PR [HOW FAST CAN YOU READ?]
  PR [ ]
  PR [1. TOP SPEED]
  PR [2. MEDIUM SPEED]
  PR [3. SLOW SPEED]
  PR [ ]
  PR [ENTER 1, 2, OR 3 AND PRESS RE
TURN.]
  MAKE "LEV FIRST REQUEST
  PR [ ]
  PR [PRESS RETURN TO BEGIN.]
  RUN REQUEST CLEARTEXT
END

TO GAME
  PHRASE CHECK ADD.SCORE
  IF :V<11 GAME
END

TO PHRASE
  MAKE "X ITEM :V :L
  CURSOR 9 8
  PR :X
  IF :LEV = 1 WAIT 30
  IF :LEV = 2 WAIT 70
  IF :LEV = 3 WAIT 95
END

TO WAIT :TIME
  REPEAT :TIME * 20 [ ]
END

TO CHECK
  CLEARTEXT PR [ ]
  PR [ENTER THE PHRASE THAT YOU
JUST SAW:]
  MAKE "Y REQUEST
  CURSOR 0 15
  IF :Y = :X TWENTY
  IF :Y = BF :X FIFTEEN
  IF :Y = BL :X FIFTEEN
  IF :Y = BF BF :X TEN
  IF :Y = BL BL :X TEN
  IF :Y = BF BL :X TEN
  IF :Y = BL BL BL :X FIVE
  IF :Y = BF BF BF :X FIVE
  IF :Y = BF BL BL :X FIVE
  IF :Y = BL BF BF :X FIVE
  IF :Y = [ ] ZERO
  IF :FL = 0 ZERO
  MAKE "FL 0
END

TO ADD.SCORE
  MAKE "V :V+1
  CURSOR 0 17
  PR [TOTAL SCORE =]
  PR :SCORE PR [ ]
  PR [PRESS RETURN TO CONTINUE.]
  RUN REQUEST CLEARTEXT
END

TO FINISH
  PR [YOUR FINAL SCORE IS:]
  PR :SCORE
  PR [OUT OF 200 POSSIBLE.]
  PR [ ]
  PR [DO YOU WANT TO TRY AGAIN?]
  TEST RQ = [YES]
  IFT START
  PR [ ] PR [GOODBYE. . . .]
END
```

■

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GOTO/READ. . .DATA

BY SANDRA MARKLE

In this sixth installment of the "BASIC Challenge Cards" column, beginning programmers learn how to use the GOTO command to create program loops; intermediate programmers learn how to use the READ. . .DATA command to assign values to variables.

The column includes two activity cards for beginners and two activity cards for intermediate level students (see pages 49 and 51). Accompanying the cards is a section of teachers' notes that define the new commands and provide learning objectives and answers to the task card activities.

BEGINNER TASK CARD COMMANDS

The GOTO command, which is always followed by a line number, instructs the computer to jump to a specific section of the program. This command is particularly useful in making the computer repeat a set of commands continuously. This repetition of commands is called a *loop*. The following program is an example of a program loop created with GOTO.

```
NEW
10 PRINT "GARBAGE"
20 GOTO 10
30 END
```

Enter the program into your computer. Line 10 instructs the computer to display the word GARBAGE on the screen. The GOTO 10 command in line 20 sends the computer back to line 10, where it again displays the word GARBAGE. The computer continues to pass from line 10 to line 20 and back again without stopping, each time displaying the word GARBAGE.

Run the program. Because the computer never reaches the END statement in line 30, the program never ends. To stop it, press the BREAK key or the CTRL and C keys simultaneously. (If you have a Commodore, press the RUN/STOP and RESTORE keys simultaneously.)

INTERMEDIATE TASK CARD COMMANDS

In the first installment of this column (October 1985), intermediate programmers learned how to use the INPUT command to assign values to variables.

For example, the following program asks the user to enter two numbers, which the computer then assigns to the variables A and B (line 20). In line 30, the computer adds the numbers and displays the answer.

```
NEW
10 PRINT "WHAT TWO NUMBERS DO
   YOU WANT TO ADD?"
20 INPUT A,B
30 PRINT A;"+";B;"=";A+B
40 END
```

Notice that the user can only assign one value at a time to the variables. To add six pairs of numbers, for example, he or she would have to run the program six times.

The paired commands READ . . .DATA allow programmers to assign values to variables more efficiently. Enter this revised version of the program into your computer.

```
NEW
10 DATA 2,4
20 DATA 6,8
30 DATA 3,5
40 DATA 1,7
50 DATA 9,2
60 DATA 4,6
70 READ A,B
80 PRINT A;"+";B;"=";A+B
90 GOTO 70
100 END
```

The DATA statements in lines 10 through 60 contain the six pairs of numbers that are to be added. (Notice that each piece of data, in this case each number, is separated by a comma.) These DATA statements can appear anywhere in the program: beginning, middle, or end. Also, they could be grouped together in one spot or scattered throughout. No matter where the DATA statements appear in the program, the values that they contain will be processed in order. Therefore, in this program, the numbers 2 and 4 (line 10) will be processed first and the numbers 4 and 6 (line 60) will be processed last.

The READ statement in line 70 signals the computer to assign values to the variables A and B. First, the computer assigns the values 2 and 4 to the variables. In line 80, the computer adds the numbers and displays the answer (6).

The GOTO statement in line 90 sends the computer back to the READ statement. Because the computer has already processed the first two numbers in the DATA statements, it moves on to the next two numbers, which are 6 and 8 (line 20). It assigns these new numbers to the variables A and B, adds them together, and displays the answer (14).

Next, the computer loops back to the READ statement to process the third set of numbers (line 30), and then the fourth, the fifth, and, finally, the sixth set of numbers.

Run the program. Your screen will look like this:

```
RUN
2+4=6
6+8=14
3+5=8
1+7=8
9+2=11
4+6=10
OUT OF DATA
```

The OUT OF DATA message means that the computer ran out of values to process. To prevent this signal from appearing, programmers add a dummy piece of data, called a *flag*, to signal the end of the data. The flag can be any value that is not contained in a previous DATA statement. Add

(continued on page 50)

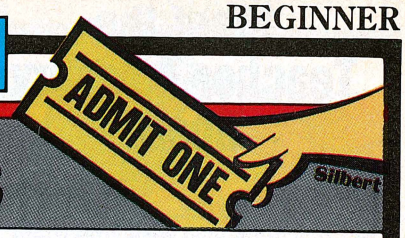
CUT OUT AND LAMINATE

BEGINNER

11

BASIC TASK CARD

TICKET SALES



Story Problem:

Julie has 423 tickets to sell. She sells 168 on Thursday and 175 on Friday. How many does she have left to sell on Saturday?

This program is supposed to display the answer to the story problem. However, the line number is missing after the GOTO statement in line 20.

```
NEW
10 PRINT "THE ANSWER TO THE PROBLEM IS"
20 GOTO _____
30 PRINT 423 + (168-175)
40 PRINT 168 + 175 * 423
50 PRINT 423 - (168 + 175)
60 PRINT (168 * 175)/2 - 423
70 END
```

1. Run the program as it is. Write down what happens on a piece of paper.
2. Change line 20 to GOTO 20. Run the program again and write down what happens.
3. Change line 20 to GOTO 60. Run the program and write down what happens.
4. Debug the program by inserting the correct line number after GOTO in line 20. Write down the answer to the story problem.

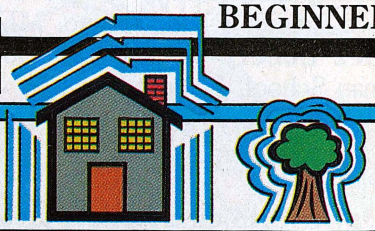
ANSWERS: Check with your teacher.

BEGINNER

12

BASIC TASK CARD

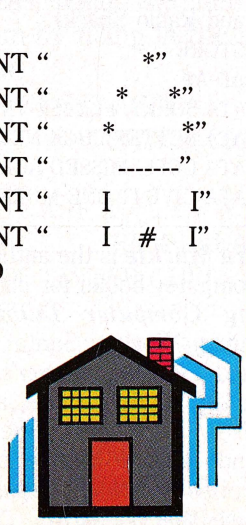
MOVING UP

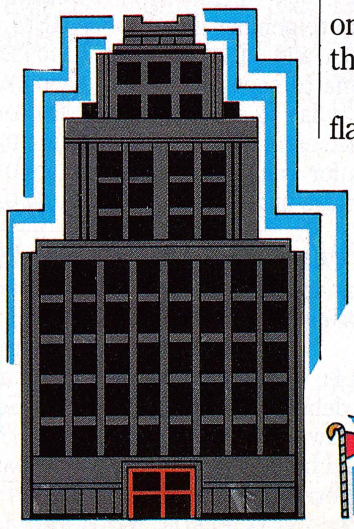


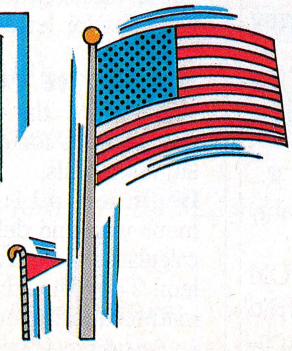
This program makes the computer draw a little house on the screen. Enter it into your computer and run it.

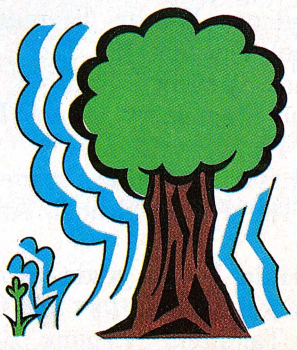
```
NEW
10 PRINT "        *"
20 PRINT "      *   *"
30 PRINT "    *       *"
40 PRINT "  -------"
50 PRINT "  I     I"
60 PRINT "  I  #  I"
70 END
```

1. Add a GOTO command that will make the house stretch into a skyscraper.
2. Write a program that displays a little tree on the screen. Use a GOTO statement to make the little tree grow into a big tree.
3. Use GOTO to write a program that raises a flag up a flagpole.









ANSWERS: Check with your teacher.

Meet the Teacher Advisory Board

The following computer-using teachers are very important to *Teaching and Computers*. They are the classroom experts who provide *T&C* editors and artists with feedback and article ideas each month.

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BASIC CHALLENGE CARDS

(continued from page 48)

these lines to the program:

```
65 DATA -1,-1
75 IF A=-1 THEN 100
```

Line 75 tests for the flag (-1). If the statement is true, the computer exits the loop and ends the program (line 100). If it is false, the computer continues processing. Run the program again. This time, the computer will display the six math equations and then simply stop processing.

In this program, once a value has been read and processed, it is discarded. To reuse that value, you can use the RESTORE command. The RESTORE command sets the computer's pointer back to the first piece of data so that it can be read again. Add these lines to the program:

```
100 PRINT "LET'S SUBTRACT NOW."
110 RESTORE
120 READ A,B
130 IF A=-1 THEN 160
140 PRINT A;"-";B;"=";A-B
150 GOTO 120
160 END
```

Run the program again. The computer will process the numbers in the DATA statements twice, first by adding and then by subtracting them.

READ. . .DATA and RESTORE statements can also be used to assign values to string variables. Simply substitute letters or words for the numbers in the DATA statements and substitute string variables, such as A$ and B$, for the numeric variables in the READ statement. (See the October, 1985 column for an introduction to string variables.)

Three rules to remember when using READ. . .DATA and RESTORE are: (1) Use a comma to separate pieces of data; (2) use a flag to avoid getting an OUT OF DATA error; (3) use numeric variables for values and string variables for letters and words.

USING THE TASK CARDS

Here are the learning objectives and answers for each of the four BASIC task cards.

Beginner #11: Students experiment with and debug a program that calculates the answer to a story problem. They should be familiar with the mathematical operators +, -, *, and /. *Answers:* (1) SYNTAX ERROR; (2) computer is locked in an infinite loop; (3) computer displays 14,277, which is the wrong answer; (4) 50.

Beginner #12: Students use the GOTO command to make an infinite loop. The loop makes the computer display a skyscraper that grows higher and higher. They use similar means to make a tree grow taller and a flag move up a flagpole. *Answers:* (1) 70 GOTO 40; (2 – 3) answers will vary.

Intermediate #11: Students debug and use a program that converts some English measurements to metric measurements, and vice versa. They then add two other measurement conversions to the program. Students should be familiar with decimals. *Answers:* (1) Change lines 120 and 1000 to:

```
100 RESTORE:FOR I=1 TO C:READ
    X:NEXT I
1000 DATA 2.5,.9,1.6,.04,3.3
```

a) 6.3 meters; b) .64 inches; c) 40 kilometers; d) 10 centimeters; e) 19.8 feet.

(2) Add these lines to the program:

```
72 PRINT "6. OUNCES TO GRAMS."
73 PRINT "7. POUNDS TO KILOMETERS."
80 PRINT:PRINT "ENTER A NUMBER
   FROM 1 TO 7."
90 INPUT C:IF C < 1 OR C > 7 THEN 80
1000 DATA 2.5,.9,1.6,.04,3.3,28,.45
```

Intermediate #12: Students complete a number-guessing program that uses READ. . .DATA and RESTORE statements. *Answer:* 40 N=1:HOME (Apple), PRINT CHR$(125) (Atari), PRINT CHR$(147) (Commodore), CLS (IBM and Radio Shack)

```
110 RESTORE
130 READ A$
1000 DATA SORRY. PLEASE TRY AGAIN.
1010 DATA BETTER LUCK NEXT TIME.
1020 DATA OOPS. MISSED AGAIN.
1030 DATA GIVE IT ONE MORE SHOT.
```

Sandra Markle is the author of several computer books for children, including *Computer Tutor Junior* (Learning Works, Santa Barbara, CA) and *The Programmer's Guide to the Galaxy* (Lothrop, Lee, and Shepard, New York, NY). She and her husband William Markle are coauthors of *In Search of Graphics* (Lothrop, Lee, and Shepard).

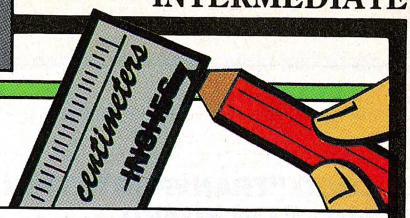
CUT OUT AND LAMINATE

INTERMEDIATE

11

BASIC TASK CARD

FOR GOOD MEASURE



ACTIVITY 1

The program at right is supposed to change some English measurements into metric measurements, and vice versa. However, it has three bugs in it. Find and fix the bugs. Then use the program to make these conversions:

a. 7 yards = _____ meters.
b. 16 millimeters = _____ inches.
c. 25 miles = _____ kilometers.
d. 4 inches = _____ centimeters.
e. 6 meters = _____ feet.

ACTIVITY 2

Change the program so that it can convert ounces to grams (1 ounce = 28 grams) and pounds to kilograms (1 pound = .45 kilograms).

```
10 REM CHANGE
20 PRINT "WHICH CHANGE DO YOU WANT TO
   MAKE?"
30 PRINT "1. INCHES TO CENTIMETERS."
40 PRINT "2. YARDS TO METERS."
50 PRINT "3. MILES TO KILOMETERS."
60 PRINT "4. MILLIMETERS TO INCHES."
70 PRINT "5. METERS TO FEET."
80 PRINT:PRINT "ENTER A NUMBER FROM 1 TO
   5."
90 INPUT C: IF C < 1 OR C > 5 THEN 80
100 RESTORE:FOR I=1 TO C:READ _____:NEXT I
110 PRINT "ENTER THE NUMBER TO
    CHANGE.":INPUT N
120 PRINT "THE RESULT IS ";N * X;"."
130 PRINT "RUN IT AGAIN?"
140 INPUT A$: IF A$="Y" OR A$="YES" THEN 10
150 END
1000 DAT 2.5,.9,1.6,.04,3.3
```

Atari users: Add this line: 1 DIM A$(5)

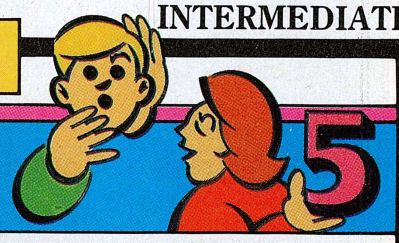
ANSWERS: Check with your teacher.

INTERMEDIATE

12

BASIC TASK CARD

Guess Again!



This program is part of a number guessing game for two people. One person enters a secret number and the other person gets five tries to guess what the number is. Complete the program by filling in the blanks. Then try it with a friend.

```
10 REM GUESS AGAIN
20 PRINT "ENTER A SECRET NUMBER FROM 1 TO
   100."
30 INPUT X:IF X < 1 OR X > 100 THEN 30
40 N=1:_____:REM CLEAR THE SCREEN
50 PRINT "ENTER GUESS #";N;"."
60 INPUT Q
70 IF Q=X THEN PRINT "GREAT WORK!":GOTO
   150
80 IF N=5 THEN PRINT "THE ANSWER IS
   ";X:GOTO 150
90 IF Q < X THEN PRINT "TOO LOW."
100 IF Q > X THEN PRINT "TOO HIGH."
110 _____:REM SET POINTER TO FIRST PIECE OF
    DATA
120 FOR I=1 TO N
130 _____:REM ASSIGN DATA TO VARIABLE A$
140 NEXT I:PRINT A$:N=N+1:GOTO 50
150 PRINT "SHALL WE PLAY AGAIN?"
160 INPUT Y$:IF Y$="Y" OR Y$="YES" THEN 10
170 END
1000 DATA _____:REM ADD A COMMENT
     THAT TELLS THE PLAYER TO GUESS AGAIN
1010 _____:REM ADD ANOTHER COM
     MENT TO THE PLAYER
1020 _____:REM ADD YET ANOTHER COM
     MENT
1030_____:REM ADD ONE LAST COMMENT
```

Atari users: Add this line: 1 DIM A$(100),Y$(5)

ANSWERS: Check with your teacher.

MICRO IDEAS

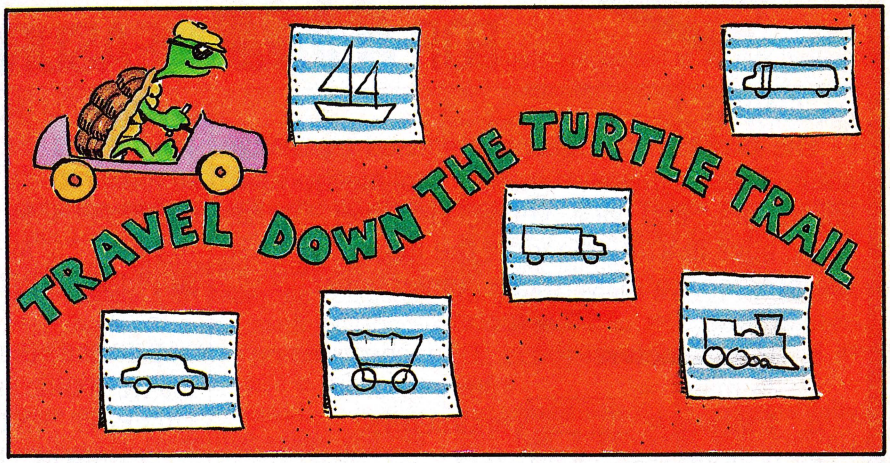
QUICK COMPUTER TIPS AND ACTIVITIES

LOGO "TRANSPORTATION" BULLETIN BOARD

Combine a unit on Logo art with one on modes of transportation, and you'll have the makings of a bulletin board that keeps on trucking!

First, have your students use Logo to create drawings of transportation vehicles, such as cars, buses, airplanes, subways, trains, and boats. What other ways are there to get from one place to another? How about horses, covered wagons, chariots, and other forms of transportation from days gone by? Encourage kids to illustrate some of these. And don't forget pictures of bicycles, pogo sticks, and skateboards!

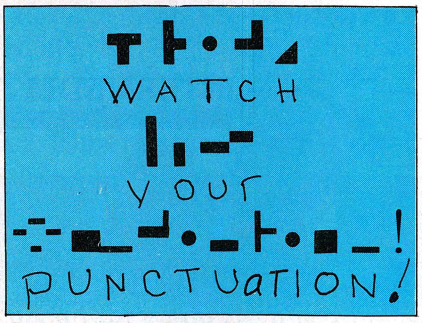
Arrange a bulletin board so that the drawings are interspersed between the construction paper words "Travel Down the Turtle Trail." Move the letters of the words about so that they seem to follow a trail (see illustration).



Use Logo art to teach kids about different types of transportation.

Cut a Logo turtle (about one foot high) out of construction paper to add to the bulletin board. Then have kids design a special vehicle to help the turtle move down Turtle Trail. Conduct a contest to see who can design the best buggy. Have the class vote on a winner to put up on the board. Put your turtle and his vehicle at the front of the trail.

Kathleen Byrd
Gulf Stream, FL



Create cryptic messages.

COMMODORE AND ATARI CRYPTOGRAPHY CODES

Have the kids in your class devise "secret alphabets" with which to stump their friends. They can do so by using the graphic symbol keys on Atari or Commodore 64 computers. On the Atari, the designs result when the CONTROL key and certain letter keys are pressed simultaneously. On the Commodore 64, you have a wider variety of symbols to choose from, depending on whether you press SHIFT or the Commodore key, plus one of the letter keys that "houses" a graphic symbol.

Have the children start out by designing simple codes. The most basic, for example, is to have each graphic symbol stand for the letter it shares a key with. A more complicated code might designate certain keys for design use only, and then intersperse these designs with keys that are assigned "alphabet" symbols. Once messages are coded, student decoders must figure them out.

Occasionally, I use code symbols to send students messages about their classwork. I find that they accept criticism with a better attitude this way than if I had simply written something like "watch your punctuation" in plain English.

Louise Miner
San Antonio, TX

MAKE A DATA FILE OF BOOK REVIEWS

Since National Library Week runs from April 6 through 12 this year, now is a fitting time to have students create a data file of book reviews. Children can then consult the file whenever they are looking for a good library book to read.

First, discuss with students the elements of a book review. Start by having everyone clip one from a newspaper and examine its makeup. For discussion, you might bring up:

- the facts reviews give about books;
- the types of opinions given in reviews;
- how one distinguishes fact from opinion.

Have students use asterisks to set up a rating system for the books reviewed. Our class used this one:

**** excellent *** good
** fair * poor

After the discussion, students will be ready to pick a book, read it, and review it. Have everyone do their reviews on paper first. Reviews should be short (approximately three paragraphs). They should not give away too much information about what happens in the book. (Remind children to include their asterisk rating system.)

After students have written their reviews, boot up your word processing program and send students to the computer, one at a time, to type in their reviews. Tell children to add their name at the end of their review. Other readers then know who to ask about a particular book should they have questions. Save the book reviews under the file name BOOKS. Encourage students to consult and add to the BOOKS file at any time.

Anthony D. Fredericks
Mertztown, PA

Philip Scheuer

TEACHING and computers April 1986 *(Expires August 1)*

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a. ☐ Recommend type/brand
b. ☐ Approve purchase
c. ☐ Both of the above

2. What is your primary involvement with Computer Software?
a. ☐ Identify need
b. ☐ Recommend program
c. ☐ Approve purchase
d. ☐ All of the above

3. Do you purchase computing products at:
a. ☐ Computer Retailer
b. ☐ Educational Dealer
c. ☐ Catalog
d. ☐ Mass merchandiser

4. Do you recommend to students and parents?
Yes ☐ No ☐

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120
121	122	123	124	125	126
127	128	129	130	131	132
133	134	135	136	137	138
139	140	141	142	143	144
145	146	147	148	149	150

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1. What is your primary involvement with Computer Hardware?
a. ☐ Recommend type/brand
b. ☐ Approve purchase
c. ☐ Both of the above

2. What is your primary involvement with Computer Software?
a. ☐ Identify need
b. ☐ Recommend program
c. ☐ Approve purchase
d. ☐ All of the above

3. Do you purchase computing products at:
a. ☐ Computer Retailer
b. ☐ Educational Dealer
c. ☐ Catalog
d. ☐ Mass merchandiser

4. Do you recommend to students and parents?
Yes ☐ No ☐

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Please check an entry for each category.

1. What is your primary involvement with Computer Hardware?
a. ☐ Recommend type/brand
b. ☐ Approve purchase
c. ☐ Both of the above

2. What is your primary involvement with Computer Software?
a. ☐ Identify need
b. ☐ Recommend program
c. ☐ Approve purchase
d. ☐ All of the above

3. Do you purchase computing products at:
a. ☐ Computer Retailer
b. ☐ Educational Dealer
c. ☐ Catalog
d. ☐ Mass merchandiser

4. Do you recommend to students and parents?
Yes ☐ No ☐

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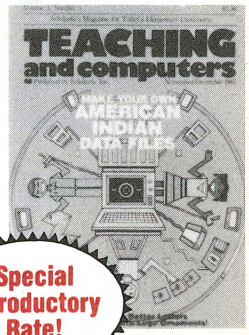

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MICRO IDEAS

FINGERPAINT WITH LOGO

Here is an Apple Logo procedure that allows children to "fingerpaint" on their computer monitor. In other words, it lets kids create random designs by controlling the movements of the turtle with a joystick or paddle. By pressing the Ø button on a joystick or paddle, students can clear the computer screen. Pressing the number 1 button changes the background color (if you have a color monitor). Because the keyboard is not used at all, the program is suitable for very young children.

To use PAINT, enter the following three procedures and type INTRO. Press CONTROL G to end the program.

```
TO INTRO
  CLEARTEXT
  PR [USE A JOYSTICK TO MOVE THE
TURTLE.]
  PR [BUTTON Ø CLEARS THE SCREEN.]
  PR [BUTTON 1 CHANGES THE BACK-
GROUND.]
  WAIT 300
  PAINT
END

TO PAINT
  FULLSCREEN
  MAKE "R (PADDLE Ø)
  MAKE "F (PADDLE 1)
  MAKE "C (BUTTONP 1)
  MAKE "B (BUTTONP Ø)
  IF :F < 50 [FD 10 WAIT 5]
  IF :F > 200 [BK 10 WAIT 5]
  IF :R < 50 [LT 10]
  IF :R > 200 [RT 10]
  IF :C [CS WAIT 100]
  IF :B [CHANGEBG]
  DRAW
END

TO CHANGEBG
  MAKE "B RANDOM 6
  SETBG :B
END
```

Joanne Davis
New York, NY

SEND US YOUR MICRO IDEAS

Do you have computer activities, bulletin board ideas, or other tips to share? Send them to Micro Ideas, *Teaching and Computers,* 730 Broadway, New York, NY 10003. ■

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- ★ PRINTS 3 DIFFERENT PROGRESS NOTES TO PARENTS
- ★ ATTENDANCE OPTION BUILT IN
- ★ FULL CORRECTIONS ROUTINE MAKES FINDING ERRORS ALMOST FUN

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HAVE YOU SEEN THIS CHILD?

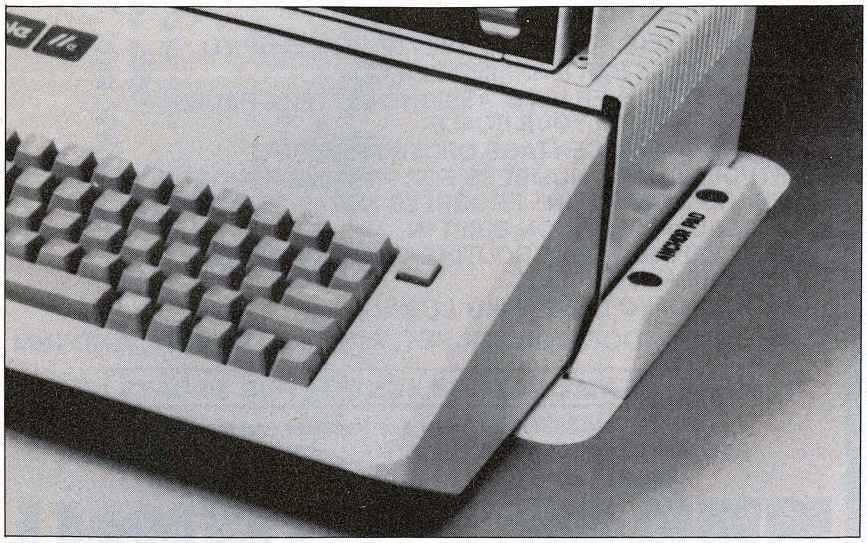
SHERI LYNN CHIOSIE

Born: February 9, 1979
Missing From: Monroe, NY
Missing Since: October 28, 1979
Eyes: Brown
Hair: Brown

If you have information on the whereabouts of Sheri (case #1501), or if you suspect another child of being a victim of abduction, please contact CHILD FIND, INC. P.O. BOX 277, New Paltz, NY 12561; 800/426-5678. All information will be handled in strict confidence.

TOOLS OF THE TRADE

NEW AND USEFUL COMPUTER PRODUCTS



COMPUTER SECURITY LOCK

The Anchor Pad K-12 meets the computer security needs of most schools, and at a price that even fits tight budgets.

An adhesive mat, which adheres to a desk or tabletop, serves as the base of the Anchor Pad K-12. The mat does not damage furniture, and yet, to pry it loose requires more than 6,000 pounds of pulling force. (Something very few students are capable of!)

A steel plate attaches to the mat and to the computer. This creates not only a sturdy, but a visible deterrent to prospective thieves. Authorized persons can be given a set of keys that enable equipment removal.

The Anchor Pad K-12 is available in two versions. A single component model secures a CPU or printer alone; a two-shelf model secures the CPU plus two disk drives, and a standard monitor.

Price: *If ordered in quantity and for school use, a single component can cost as little as $60; a two-shelf system under $100.* Contact: *Anchor Pad International, Inc., 4483 McGrath St., Ventura, CA 93003; 800/4-ANCHOR outside California; 800/6-ANCHOR within the state.*

(Circle 2 on Reader Service Card.)

ELECTRONIC ANIMATION TOY

Ohio Art's new Etch-A-Sketch Animator allows children age 6 and up to create computerized graphics, save them, and then combine the images to make electronic "flip books," or moving pictures.

First, a child uses the toy's graphic capabilities to make a picture. To do this, he or she presses the "draw" button located below the screen, and then uses knobs on either side of the toy to create designs, pictures, or patterns. The right knob allows the cursor to draw up-and-down lines; the left knob allows the cursor to draw from side to side. The child saves the images he or she creates in the toy's memory. To change the picture, the child recalls the image, alters it as desired, and saves the new product. After all the images the child wants have been entered in sequential order (up to 12), he or she presses the "animate" button.

The stored graphics appear quickly, one by one, on the screen, creating the illusion of a moving picture. These images can be re-created on the screen in any combination, up to 96 times. A user can even program the action to move at one of several different speeds.

An instruction book explains the procedures used to perform each of the toy's functions. It also suggests possible drawings.

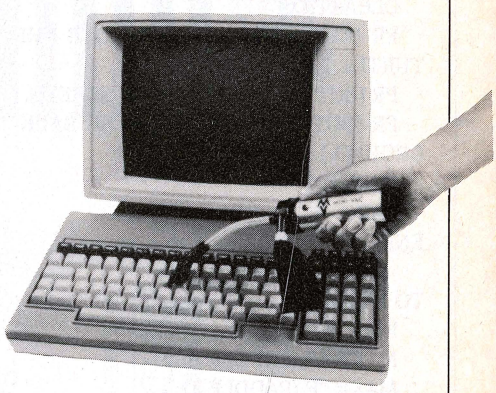
Price: *$59.* Contact: *Ohio Art, 720 East High St., P.O. Box 111, Bryan, OH 43506; 419/636-3141.*

(Circle 3 on Reader Service Card.)

VACUUM CLEANER FOR COMPUTERS

Next time your computer keyboard looks dusty, try cleaning it with a vacuum cleaner. Sounds a little impractical? Maybe not. Mini-Vac is designed just for that purpose. It is a mini-vacuum cleaner that removes dust particles from hard-to-reach areas of computers, cameras, typewriters, stereo systems, and other electronic equipment.

Mini-Vac is much smaller than a regular vacuum cleaner (5" x $1\frac{1}{4}$" x $1\frac{1}{4}$"). It weighs only six ounces, and is easily hand-held. But unlike compressed air cleaning systems which disperse pollutants, Mini-Vac sucks them up permanently.



The product comes with two bristle brushes and two interchangeable "wands" (attachments). These parts allow you to clean the crevice between the computer monitor and keyboard (a problem cleaning spot on some models), and other hard-to-reach areas. Mini-Vac should not be used to clean disk drives.

A four-inch cloth vacuum bag attached to Mini-Vac holds the dust. This bag, and complete instructions on how to assemble, clean, and use Mini-Vac are included in the price of purchase. The nine-volt alkaline battery, which is needed to operate Mini-Vac, is not supplied.

Price: *$29.95 plus $2 shipping and handling.* Contact: *The Pine Cone, Dept. TC-385, Blake Building, P.O. Box 1378, Gilroy, CA 95021; 408/842-7597. Allow 3-4 weeks for delivery.*

(Circle 1 on Reader Service Card.)

SOFTWARE SHOWCASE

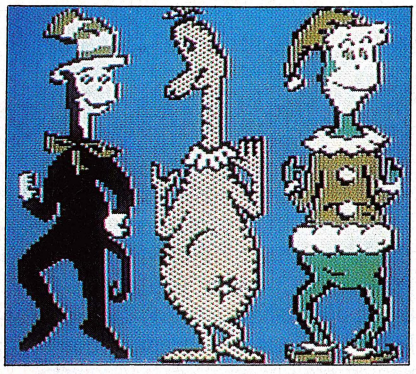
SOFTWARE RECOMMENDED FOR TEACHERS, BY TEACHERS

DR. SEUSS: FIX-UP THE MIX-UP PUZZLER

Computer: Commodore 64,128; Apple II series
Topic: Problem solving
Grade Level: Preschool–6

Pictures of the Grinch, the Star-Bellied Sneetch, the Cat in the Hat, and other Dr. Seuss characters are all mixed-up in this electronic jigsaw puzzle program. Children practice problem solving, sequencing, object and pattern recognition, and logic and memory skills as they reassemble scrambled pictures, each containing three Dr. Seuss characters.

The game has five levels. On level one, children use nine puzzle pieces to create three Dr. Seuss characters, in any order. On other levels, the characters are divided into smaller pieces and must be reassembled to match the left-to-right order of appearance displayed on the screen. Some puzzle pieces may also appear upside down. The higher the skill level, the more challenging the game becomes. Higher levels also reward children with extra points for completing puzzles in less time.



Kids create Dr. Suess characters.

Children can use the keyboard, a joystick, or the Muppet Learning Keys to move puzzle pieces. To assemble a puzzle, players must create an empty space in the puzzle area by moving one of the puzzle pieces to a box on the right-hand side of the screen called a "Space Holder." This can be a very difficult concept for children to grasp.

Teachers should provide guided instruction to young children before allowing them to use the program independently. Preschool children may require guidance at all times. Teachers also should show students how to turn off the sound if other children are working nearby. The music can be very disruptive.

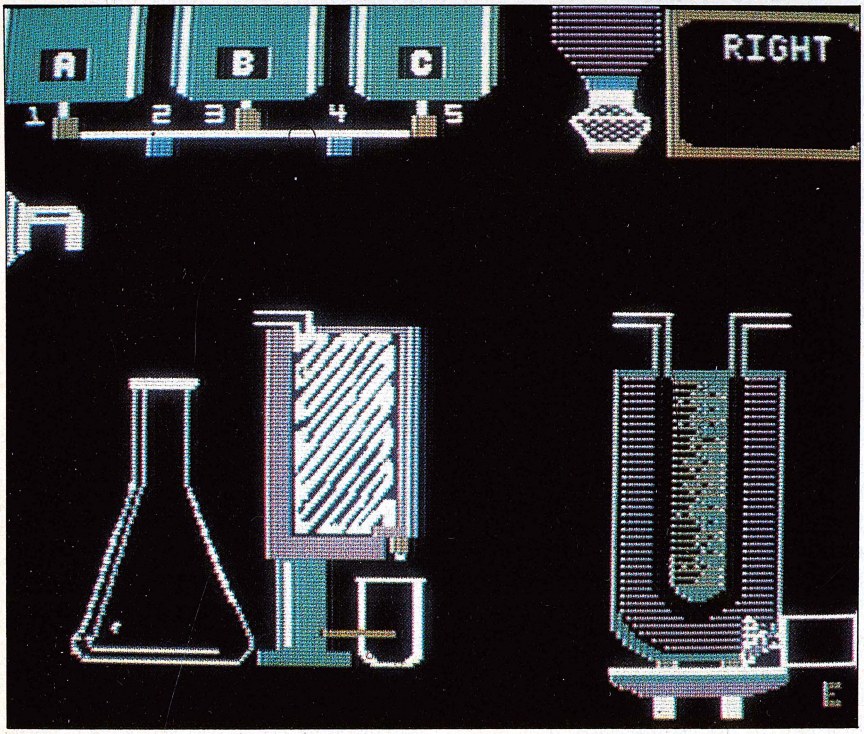
The program's graphics are good if they appear on a color monitor. There isn't enough contrast on a black and white monitor, however, to allow young children to distinguish the puzzle pieces easily.

The documentation is fair. Novices may have a hard time understanding the written instructions. Onscreen directions could also be improved.

If adequate instruction is provided by the teacher, this program offers a useful and challenging classroom activity. Allowing children to work in pairs or groups encourages collaborative problem solving.

Price: $41.95
Policy: Backup included; 30-day preview
Source: CBS Software, One Fawcett Place, Greenwich, CT 06836; 800/ASK-CBS4

Sharon Wright, Teacher
Corte Madera School, Portola Valley, CA



Chem Lab *is based on actual chemistry principles and allows students to "perform" experiments that would otherwise be too costly.*

CHEM LAB

Computer: Commodore 64; IBM PC,PCjr; Apple II series
Topic: Science
Grade Level: 6–12

"Your favorite teacher is in the middle of a lesson, and just as he's drawing a map of Asia Minor, he runs out of chalk! Can you create the chalk he needs before school is out?"

That's the problem description for one of 50 experiments students can perform in *Chem Lab,* a flexible laboratory simulation program that puts a chemistry set inside your computer. The experiments, which are based on authentic chemistry principles, mimic actual reactions that occur in a scientific laboratory.

Experiments are rated according to three difficulty levels, suitable for (1) lab assistants, (2) chemists, or (3) nobel prize winners. Once an experiment has been chosen, a description of the problem, the target substance (the chemical you are trying to create), and a list of raw materials ap-

(continued)

pear on the screen. Target substances include synthetic diamonds, gasoline, silicon chips, and laughing gas. For example, the target substance in the experiment above is chalk ($CaCO_3$). It requires a combination of calcium hydroxide, carbonic acid, nitrogen, and hydrogen.

To work on an experiment, students travel to the onscreen lab, where they use keyboard commands to activate a pair of robot arms. The arms manipulate equipment, such as beakers, flasks, collectors, condensers, and dryers. Students use keyboard commands to mix, heat, and pressurize solids, liquids, and gases. The results of the experiments are graphically displayed and explained in text on the screen.

An 86-page hard-backed manual accompanies the program. Written for students, it contains clear and concise program instructions as well as explanations of the science concepts involved. It also includes a list of chemical terms, formulas for the chemicals used in the program, a periodic table of elements, and a notebook where students can record experimental results.

Chem Lab is the perfect science program. It allows teachers and students to simulate costly and dangerous experiments on the computer without great expense, safety worries, or messes. An excellent addition to any classroom, *Chem Lab* offers flexibility and endless possibilities.

Price: $39.95
Policy: Provisions to make one backup; No preview
Source: Simon & Schuster, Inc., 1230 Avenue of the Americas, New York, NY 10020; 800/223-2336. In New York call 800/442-7070

Larry Pogue, Computer Coordinator
City Schools, Huber Heights, OH

U.S. ATLAS ACTION

Computer: Apple II series
Topic: Social studies
Grade Level: 4–12

"Go to the top of the Gateway Arch and take a ride on a riverboat when you visit this city." Can you guess the name of the city that this clue describes? *(The answer is St. Louis.)*

U.S. Atlas Action helps students review geography facts about the nation as a whole, its regions, and individual states through geography facts games that contain questions like the one above, and through map games that provide practice in locating major landmarks. It has all the features a good program of this type should have.

Map games and geography facts games are on separate disks. The map games use three kinds of detailed onscreen maps: U.S. maps, region maps, and state maps to test students on geography facts. Students choose the kind of map and the game. Nineteen games are available from identifying state capitals on a U.S. map to locating key cities on a state map.

Users can also create their own map games. The program editor contains 58 blank maps and a variety of map symbols that can be placed on the maps and named. This feature allows teachers to customize the program to suit their curriculum.

The geography facts disk contains question-and-answer geography games and the records for both the geography facts games and the map games. Six built-in multiple-choice games test students on state capitals, U.S. landmarks, farms and manufacturing, famous cities, state facts, and geography trivia. Teachers can also create and save two additional multiple-choice games with the program's editor.

Students can play geography facts and map games alone or compete against one another. A scoreboard appears on the screen after each game. The program's record keeping system displays and stores records for up to 40 students. It allows teachers to see or print a single record, or records for all the students at once.

Game control options can be changed to suit individual needs. These include response time, length of game, method of input (joystick or keyboard), and sound.

The manual is clear and thorough in describing teaching objectives and providing other information that teachers need to use the program. It also contains nine supplementary classroom activities.

U.S. Atlas Action is technically well-designed and easy to use. It is especially useful for reviewing U.S. geography in class. The program editor allows students to take responsibility for their own learning by creating games to help them study.

Price: $44
Policy: $15 backup; 30-day preview
Source: Developmental Learning Materials, One DLM Park, Allen, TX 75002; 800/527-4747

Michael Rand, Computer Consultant
Teachers College, New York, NY

WORD DETECTIVE

Computer: Tandy 1000, TRS-80 Color Computer; Atari (48K); IBM PC,PCjr; Apple II series
Topic: Language arts
Grade Level: 3–12

How many words can you make from these letters: R P M S I D N? Each letter may be used only once per word. That's the challenge of *Word Detective*, a vocabulary-building game that enhances spelling, reinforces phonics skills, and stimulates interest in new words.

The program contains two disks: a program disk and a dictionary disk. Seven randomly selected letters appear at the top of the screen. Players use the letters to make as many two- to five-letter words as possible. Each letter may be used once. If the same letter appears more than once at the top of the screen, it may be used as many times as it occurs. If the seven selected letters are initially unacceptable (for example, if there are no vowels), players can receive seven new letters or enter seven letters of their own choice.

After each word is entered, the program checks its validity by searching an electronic dictionary of more than 6,000 words. If the word is not found, players are encouraged to look it up in their own dictionary. The program does not accept foreign words, dialectical terms, slang, colloquialisms, contractions, capitalized words, offensive words, hyphenated

words, and archaic or poetic terms.

When players can't think of any more words to make from the given letters, they press the "*" key. The program then searches its dictionary for additional words that could have been made and lists them on the screen. This part of the program is time consuming as it takes the computer several minutes to search the entire dictionary.

Students can choose a one- or two-player game. The two-player game can be scored based on the total number of words each player enters or on point values accumulated for each letter used. In the second method, point values for letters of the alphabet vary. For example, one point is given for using an "E" and nine points for a "Q." Players also choose whether or not to set a time limit for each turn. They may select a different length of time, from 10 to 120 seconds, for each player.

Other options allow teachers to customize the game to fit students' needs. They can add words to the dictionary, delete obscure or difficult words, list dictionary words, and change the maximum time limit per turn to any value from 10 through 200 seconds.

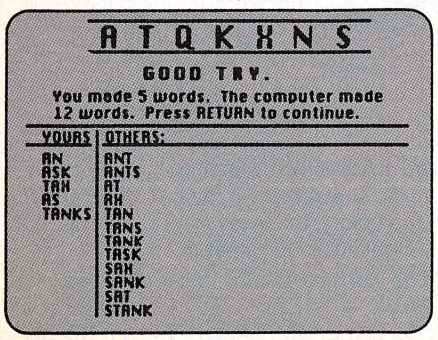
The documentation contains the program's valuable learning objectives, instructions for play, suggestions for classroom use, and reproducible worksheets to help players organize their work.

Word Detective does an excellent job of introducing children to new vocabulary. Our students were amazed at the number of words they either didn't think of or didn't know. When playing the game, I like to have a dictionary on hand so kids can look up the meaning of unfamiliar words.

Our fifth and sixth grade students enjoyed the program and found it particularly challenging. Younger children had less patience and gave up quicker. The students especially enjoyed playing in teams and challenging each other.

Price: $59
Policy: Backup included; 30-day preview
Source: Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; 800/431-1934

Adrianne Geszler, Computer Coordinator
Moreland School, Shaker Heights, OH ■

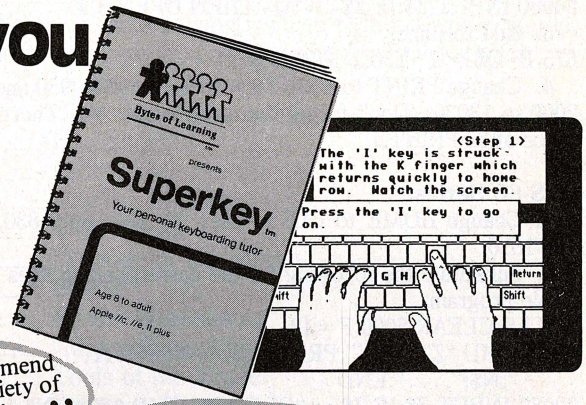


Words formed from seven letters.

Circle 28 on Reader Service Card.

We wanted to be the first to tell you

why Superkey™ should be your personal keyboarding tutor, but others beat us to it...



"We strongly recommend Superkey for a variety of instructional settings."
THE COMPUTING TEACHER

"Pick of the crop in keyboarding software"
COMPUTERS IN EDUCATION

"This is an excellent typing tutor — set apart from other keyboarding tutors with the use it makes of high resolution graphics."
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Educators agree that Superkey™, the program that animates every finger action, makes keyboarding easy and fun to learn.

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CONVERSION CHART

HOW TO CONVERT **T&C** *PROGRAMS TO OTHER MACHINES*

The *What's for Breakfast* program (page 18) is written for the Apple II series of computers. Use this conversion chart to adapt the program listing for use on Commodore 64 and the TRS-80 series of computers. For more information on how to use specific commands, refer to your user's manual.

WHAT'S FOR BREAKFAST?, page 18 (Apple)

Commodore 64

1. Change HOME to PRINT CHR$(147) in lines 20, 580, 690, 830, 970, and 1510.
2. Substitute the following for the corresponding lines in the Apple program.

```
20 PRINT CHR$(147):CLR:F=12
1020 CLOSE 3:PRINT:PRINT "BON APPETIT,
     ";N$;". . . .":END
20080 INPUT Z$:IF Z$< >"Q" THEN OPEN 3,4
```

3. Add this line:

```
675 IF Q$="1" THEN OPEN 3,3
```

4. Change PRINT to PRINT#3, in lines 690 to 980 and lines 2000 to 13030. (Don't forget the comma after #3. There is no space after PRINT.)

TRS-80 Series

1. Change HOME to CLS in lines 20, 580, 690, 830, 970, and 1510.
2. Substitute the following for the corresponding lines in the Apple program.

```
20 CLS:CLEAR 5000:F=12
1020 CMD "Z","OFF":PRINT "BON APPETIT,
     ";N$;". . . .":END
20080 INPUT Z$:IF Z$< >"Q" THEN CMD "Z","ON"
```

3. Change "PRESS RETURN" to "PRESS ENTER" in lines 220, 300, 330, 370, 410, 650, 830, 970, 20050, and 20070.

ANSWERS TO "MICRO TIMES"

Make Music With Computers

Here are answers to the review questions.

1. A *synthesizer* is an electronic machine that makes sounds.
2. *Sampling* means to record sounds and convert them into a code of zeroes of ones. The coded sounds can then be changed and rearranged.
3. .Synthesizers allow musicians to make "perfect" music (by editing out mistakes), to create unusual sounds for their music, and to "play" up to 100 different kinds of instruments on one keyboard.
4. Some people say that music played on real instruments has more energy and feeling than synthesized music.

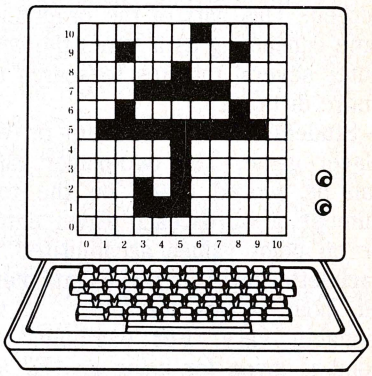
Passover Bread Program

This program will create the matzah picture on the Logo screen. Other solutions are possible.

```
TO MATZAH
  HT BREAD SETY 20 ROW
  SETX 0 SETY 40 ROW
  SETX 0 SETY 60 ROW
  SETX 0 SETY 80 ROW
END

TO BREAD
  REPEAT 2 [FD 100 RT 90 FD 139 RT 90]
END

TO ROW
  SETH 90 REPEAT 6 [PU FD 20 PD HOLE] PU
END

TO HOLE
  REPEAT 10 [FD 1 RT 36]
END
```

Micro Puzzle

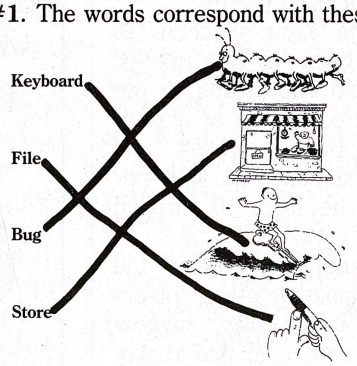
Here is the finished picture.



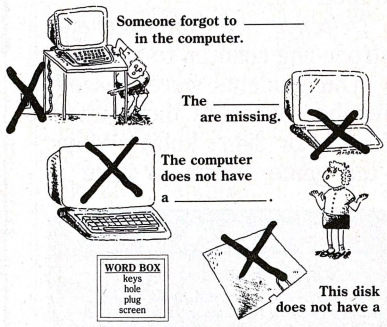
ANSWERS TO POSTER WORKSHEETS

Here are the answers to the four worksheets on the back of the poster.

Primary #1. The words correspond with these pictures:



Primary #2. Here's what's missing: 1. plug; 2. keys; 3. screen; 4. hole.



Intermediate #1. The unscrambled words are: 1. microcomputer; 2. keyboard; 3. data; 4. software; 5. bug; 6. directory; 7. programmer; 8. load; 9. cursor; 10. memory; 11. backup; 12. joystick; 13. modem; 14. montior; 15. printout.

Intermediate #2. The correct BASIC commands are: 1. END; 2. PRINT; 3. SAVE; 4. NEW; 5. RUN; 6. LOAD; 7. HOME; 8. RETURN; 9. CALL; 10. BASIC; 11. IF; 12. ENTER; 13. LET; 14. NEXT; 15. GOTO.

QUESTIONNAIRE ON
TEACHING AND COMPUTERS

DEAR EDUCATOR:

Starting in September, *Teaching and Computers* will begin its fourth year of publication. It's come a long way since the charter issue, thanks to the interest and input of teachers from across the country.

Our staff would like to continue responding to the needs of computer-using educators. You can help us. We'd like to know your reactions to this year's issues, and what you would like to see published in the future.

Please fill out the questionnaire below. Then fold the form on the dotted lines and return it to us. No stamp is needed.

Thank you for helping us make our magazine the best possible source for teaching with computers.

CUT HERE

COMPUTERS AND YOU

1. What is your job title?
   ___ Teacher ___ Computer Coordinator
   ___ Principal Other (specify)_____
   ___ Department Head _____
2. What grade(s) and/or curriculum area(s) are you primarily associated with?
   Grade Level(s): _____
   Area(s): _____
3. How many years have you taught with computers?
   ___ 1 or less ___ 3 to 5
   ___ 1 to 3 ___ More than 5
4. How many students are in your class? (Check average range if you teach more than one class.)
   ___ Less than 10 ___ 20 to 30
   ___ 10 to 20 ___ More than 30
5. How many computers are available to your class during a school period?
   ___ 1 to 3 ___ 7 to 10 ___ More than 15
   ___ 4 to 6 ___ 11 to 15
6. How many classroom hours a week (average) do you spend teaching with computers?
   ___ Less than 5 ___ 10 to 15 ___ More than 20
   ___ 5 to 10 ___ 15 to 20
7. Where are the computers that you use? (Check all that apply.)
   ___ Classroom Other(specify): _____
   ___ Laboratory _____
   ___ Library/Media Center
8. In which subject areas do you use computers? (Check all that apply.)
   ___ Math ___ Social Science
   ___ Science Other (specify):_____
   ___ English/Language Arts _____
9. What computer brand(s) do you use? (Check all that apply.)
   ___ Atari Series ___ Texas Instruments
   ___ Apple II Series ___ TRS-80 (I,III, or 4)
   ___ Commodore 64,128 ___ Color Computer
   ___ Amiga (Commodore) Other (specify):_____
   ___ IBM PC or PCjr _____

ABOUT *TEACHING AND COMPUTERS*

1. How many of the last four issues of *Teaching and Computers* have you looked at and/or read?
   ___ None ___ Two ___ All Four
   ___ One ___ Three
2. How many of your colleagues usually read or see your copy of *Teaching and Computers*?
   ___ None ___ 4 to 6
   ___ 1 to 3 ___ 7 or more
3. Which of the following regular sections would you like us to continue next year? (Check all that apply.)
   ___ Update
   ___ Classroom Happenings
   ___ Bookshelf
   ___ BASIC Challenge Cards
   ___ Ask the Experts
   ___ Micro Ideas
   ___ Program of the Month
   ___ Poster
   ___ Poster Worksheets
   ___ "Micro Times"
   ___ Tools of the Trade
   ___ Software Showcase
   ___ Conversion Chart
4. Which of the three regular sections do you like the best? (Use the list in the previous question.)
   _____
   _____
5. Which section interests you the least, and why?
   _____
   _____
6. On a scale from 1 to 5, please rank your interest in reading articles on these topics next year. (Circle appropriate number for each.)

	Of Least Interest to Me				Of Most Interest to Me
Programming in BASIC	1	2	3	4	5
Programming in Logo	1	2	3	4	5
Using Spreadsheets in Math Class	1	2	3	4	5
Word Processing Activities	1	2	3	4	5
Using Data Bases in Curricula	1	2	3	4	5
Computers and Record Keeping	1	2	3	4	5
Kindergarten and Early Primary Activities	1	2	3	4	5
Special Education	1	2	3	4	5
Short Program Listings You Can Use	1	2	3	4	5

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7. Do you consider any of the following to be frequent problems in *Teaching and Computers*? (Check all that apply.)
   ____ Program bugs
   ____ Uninteresting topics
   ____ Overly technical language
   Other (specify): _____
8. Which of the following best describes your overall evaluation of *Teaching and Computers?*
   ____ Very useful and informative
   ____ Somewhat useful and informative
   ____ Not very useful or informative
9. Additional Comments:
   _____
   _____
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